

No. 50.

TRANSCRIPT OF RECORD.

UNITED STATES CIRCUIT COURT OF APPEALS,
NINTH CIRCUIT.

OCTOBER TERM, 1891.

CONSOLIDATED PIEDMONT CABLE COMPANY,
APPELLANT.

v's.

PACIFIC CABLE RAILWAY COMPANY,
APPELLEE.

APPEAL FROM THE CIRCUIT COURT OF THE UNITED STATES,
NORTHERN DISTRICT OF CALIFORNIA.

FILED
APR 30 1892

UNITED STATES CIRCUIT COURT OF APPEALS
FOR THE NINTH CIRCUIT.

CONSOLIDATED PIEDMONT CABLE COMPANY,
APPELLANT,

vs.

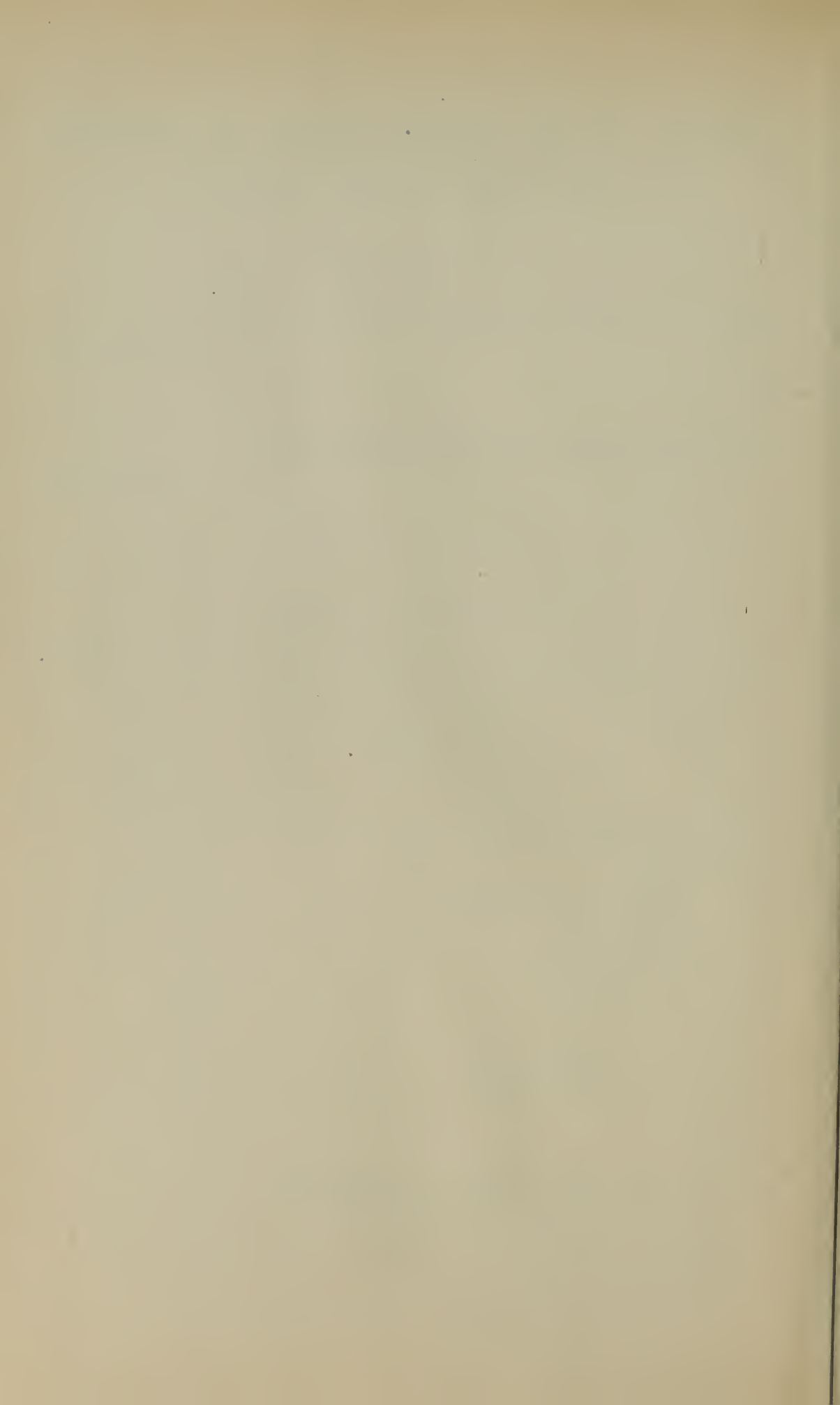
PACIFIC CABLE RAILWAY COMPANY,
APPELLEE.

TRANSCRIPT ON APPEAL.

(FROM U. S. CIRCUIT COURT, NORTHERN DISTRICT OF CALIFORNIA.)

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1

Bill of Complaint.

In the Circuit Court of the United States, Ninth Judicial Circuit, in and for the Northern District of California.

PACIFIC CABLE RAILWAY COMPANY, Complainant,) In
<i>vs.</i>	
CONSOLIDATED PIEDMONT CABLE COMPANY, Defendant.) Equity.

To the Honorable the Judges of the Circuit Court of the United States for the Northern District of California.

The Pacific Cable Railway Company, a corporation organized and existing under and by virtue of the laws of the State of California, having its principal place of business in the City and County of San Francisco, in said State, a citizen of the State of California, brings this its bill against the Consolidated Piedmont Cable Company, a corporation organized and existing under and by virtue of the laws of the State of California, having its principal place of business in the City of Oakland, County of Alameda, in said State, a citizen of said State.

And thereupon your orator complains and says, on information and belief, that William Eppelsheimer, of the City and County of San Francisco, State of California, before and at the time of his application for the hereinafter mentioned letters patent, was a citizen of the United States, and was the true, original and first inventor of a certain new and useful apparatus, described in the specification of the letters patent hereinafter mentioned, and named therein, "Clamp for Endless Rope Railways," and which was not known or used in this

2 country and not patented or described in any printed publication in this or in any foreign country before his invention thereof, and was not in public use or on sale for more than two years prior to his application for letters patent of the United States therefor.

And your orator further shows that upon due application therefor, letters patent for said invention, number 189,204, and bearing date the 3rd day of April, 1877, were in due form of law issued and delivered to said William Eppelsheimer, in the name of the United States of America, and under the seal of the Patent Office of the United States, and were signed by the Secretary of the Interior of the United States, and countersigned by the Commissioner of Patents, and that the said letters patent did grant to the said William Eppelsheimer, his heirs, administrators and assigns, for the term of seventeen years from the date thereof, the exclusive right to make, use and vend the said invention and apparatus throughout the United States and Territories thereof; and your orator makes profert of said letters patent.

And your orator further shows that before the commencement of this action and before the commission of the acts of the defendant, hereinafter complained of as an infringement, your orator became and still is the sole and exclusive owner and holder of and became and still is vested with all the right, title and interest in and to said letters patent, and the inventions therein contained, for, to and in and within and throughout the whole of the United States and Territories thereof, which lie west of the one hundred and sixth (106th) degree of longitude west from Greenwich, England, as by the several assignments, duly executed and delivered and recorded in the United States Patent Office, or duly authenticated copies thereof, ready in Court to be produced, will fully and at large appear.

And your orator further shows that your orator's exclusive rights and privileges, as secured by said letters patent have been generally acquiesced in, and that your orator and its predecessors in interest have granted licenses under said letters patent and have extensively applied to practical use the inventions therein described.

And your orator further shows, as it is informed and believes, the said defendant corporation herein, after your orator acquired title as aforesaid, to said letters patent, and the inventions therein contained and before and up to the time of the commencement of this action, and during and within the term of seventeen years mentioned in said letters patent, and within those parts of the United States covered by the assignment of said letters patent to your orator, to wit, within the State of California, in the Northern District thereof, unlawfully, wrongfully and injuriously, and with intent to derive profits from the making and using said apparatus, and to deprive your orator of the royalties which it might and otherwise would have derived from the sale of rights to make and use specimens thereof, and without the license of your orator and against its will, did make and did use, and did cause to be made and did cause to be used sundry specimens of said apparatus, and of machines which contained and employed substantially the invention covered by said letters patent in infringement of the said exclusive rights secured to your orator, as aforesaid; but how many such specimens the defendant so made and used and caused to be made and used, your orator is ignorant and cannot set forth but your orator avers on information and belief that the defendant so made and used a large number thereof, and that it derived large profits therefrom, but to what amount your orator is ignorant, and cannot set forth, and that your orator has been deprived of large royalties by reason of the aforesaid infringement of the defendant and has thus incurred large damages thereby.

And your orator further shows that it fears and has reason to fear that unless the defendant is restrained by a writ of injunction issuing out of this Court it will continue to make and use and cause to be made and used numbers of specimens of said apparatus and thereby will cause irreparable injury to your orator's aforesaid exclusive rights.

And so it is, may it please your Honors that the said defendant corporation herein, as your orator is informed and believes, without the license of your orator, against its will and in violation of its rights has constructed and used and intends still to continue to construct and use said patented apparatus within the Northern District of California, all of which is in violation of the said letters patent.

And your orator prays that the defendant corporation herein by a decree of this Honorable Court may be compelled to account for and pay over to your orator all the profits which the defendant has derived or shall have derived from any making and using or from any using of any specimen of the
5 apparatus covered and secured by said letters patent; and also that the said defendant be decreed to pay to your orator all the damages which your orator has incurred or shall have incurred on account of the defendant's infringement of said letters patent. And to the end that the defendant corporation may be restrained from any further violation of the rights of your orator, as above set forth, your orator prays that your Honors may grant a writ of injunction issuing out of and under the seal of this Honorable Court, directed to the said defendant herein, and strictly enjoining and restraining it, its officers, agents and employes from any further construction and from any further use and from any sale, in any manner of said patented apparatus, or any part or parts thereof, in violation of the rights of your orator, and that all specimens of said apparatus, or any part or parts thereof, in the possession or use or under the control of said defendant, may be destroyed or delivered up to your orator for the purpose. And also that your Honors upon the entering of a decree for an infringement, as above prayed for, may proceed to assess or cause to be assessed under your direction, in addition to the profits to be accounted for, as aforesaid, the damages your orator has sustained by reason of such infringement.

And your orator prays for a provisional or preliminary injunction, and for such other relief as the equity of the case may require and to your Honors may seem meet, together with the costs of this suit.

To the end therefore, that the defendant corporation herein, may, if it can, show reason why your orator should not have the relief herein prayed for and that it may, to the

6 best and utmost of its knowledge, remembrance, information and belief, full, true, direct and perfect answer make, but not upon oath (answer upon oath being hereby expressly waived), to each of the allegations of this bill, as though specially interrogated relative thereto: May it please your Honors to grant unto your orator, not only a writ or writs of injunction conformable to the prayer of this bill, but also a writ of subpœna, issuing out of and under the seal of this Honorable Court, directed to the Consolidated Piedmont Cable Company, the defendant herein, commanding it to appear and answer unto this bill of complaint and to perform and to abide by such order or decree as to the Court shall seem meet and be required by the principles of equity and good conscience.

And your orator will ever pray.

In witness whereof, the said complainant herein, the Pacific Cable Railway Company, has hereunto affixed its corporate seal and caused the same to be attested by J. L. Willcutt, its Secretary.

(Seal of Pac. C. Ry. Co.)

J. L. WILLCUTT,
Secretary.

WM. F. BOOTH,
Solicitor for Complainant.

WM. F. BOOTH,
Of Counsel for Complainant.

STATE OF CALIFORNIA, }
City and County of San Francisco, } ss.

Andrew S. Hallidie, being duly sworn, does depose and say, that he is the President of the Pacific Cable Railway Company, the complainant in the foregoing bill, and that by means
7 of his said office, he has acquired and possesses particular knowledge of the matters stated in said bill; that he has read the foregoing bill and knows the contents thereof, and that the same is true of his own knowledge, except as to the matters therein stated on information and belief, and as to those matters he verily believes it to be true. And he further doth depose and say, that he verily believes the said William Eppelsheimer, in the said bill of complaint named, to be the true, original and first inventor of the clamp for endless rope railways, which is described in the said letters patent granted to him and mentioned in the foregoing bill of complaint. And he doth further depose and say that he verily believes the title of complainant as set forth in the said bill, is true.

ANDREW S. HALLIDIE.

Subscribed and sworn to before me this 30th day of September, 1890.

[NOTARY SEAL.]

LINCOLN SONNTAG,
Notary Public.

(Endorsed:) Filed October 2d, 1890. L. S. B. Sawyer,
Clerk.

8 *Subpoena.*

UNITED STATES OF AMERICA:

Circuit Court of the United States, Ninth Judicial Circuit,
Northern District of California. In Equity.

The President of the United States of America, Greeting: To
Consolidated Piedmont Cable Company, a corporation organized and existing under and by virtue of the laws of the State of California, and a citizen of said State:

You are hereby commanded, That you be and appear in said Circuit Court of the United States aforesaid, at the court room in San Francisco, on the third day of November, A. D. 1890, to answer a Bill of Complaint, exhibited against you in said Court by The Pacific Cable Railway Company, a corporation, which is a citizen of the State of California, and to do and receive what the said Court shall have considered in that behalf. And this you are not to omit, under the penalty of five thousand dollars.

Witness, the Honorable Melville W. Fuller, Chief Justice of the Supreme Court of the United States, this 2nd day of October, in the year of our Lord one thousand eight hundred and ninety and of our Independence the 115th.

[SEAL.]

L. S. B. SAWYER, *Clerk.*

9 *Memorandum Pursuant to Rule 12, Supreme Court, U. S.*

You are hereby required to enter your appearance in the above suit, on or before the first Monday of November next, at the Clerk's Office of said Court, pursuant to said bill; otherwise the said bill will be taken *pro confesso.*

L. S. B. SAWYER, *Clerk.*

(Endorsed.)

UNITED STATES MARSHAL'S OFFICE,
NORTHERN DISTRICT OF CALIFORNIA.

I hereby certify, that I received the within writ on the 2nd day of October, 1890, and personally served the same on the 8th day of October, 1890, on the Consolidated Piedmont Cable Company, by delivering to and leaving with Montgomery Howe, President of said Consolidated Piedmont Cable Company, said defendant named therein personally at the County of Alameda, in said District, an attested copy thereof.

W. G. LONG,
U. S. Marshal.

By A. A. WOOD, *Deputy.*

San Francisco, Oct. 8th, 1890.

Filed Oct. 8, 1890.

L. S. B. SAWYER, *Clerk*,
By F. D. MONCKTON,
Deputy Clerk.

10 *Answer.*

In the Circuit Court of the United States, Ninth Circuit, in
and for the Northern District of California.

PACIFIC CABLE RAILWAY COMPANY, Complainant, }
vs. }
CONSOLIDATED PIEDMONT CABLE COMPANY, Defendant. }

The answer of the Consolidated Piedmont Cable Company, the defendant, to the bill of complaint of the complainant herein filed. This defendant now and at all times hereafter saving and reserving unto itself all benefit and advantage of exception which can or may be had or taken to the many errors, uncertainties and other imperfections in the said complainant's said bill of complaint contained, for answer thereto, or unto so much and such parts thereof, as this defendant is advised, is or are material or necessary for it to make answer unto, this defendant for answering, saith:

That it has been informed and admits to be true, that upon application therefor letters patent of the United States number 189,204 were granted and issued to William Eppelsheimer on the third day of April, 1877, for an alleged invention called and named in said letters patent "Clamps for Endless Rope Railways."

And further answering this defendant, on its information and belief, denies that the said alleged exclusive rights and
11 privileges alleged to be secured by said letters patent have been generally acquiesced in, or that the complainant or its predecessors in interest have granted licenses or any license under said letters patent, or that they or either of them have extensively or at all applied to practical use the said inventions therein described, or any part thereof.

And further answering, this defendant denies that either during, or within the seventeen years mentioned in said letters patent, or at any other time, or at all, either within the Northern District of California, or any where else, it did either make or did use, or did cause to be made, or did cause to be used, sundry specimens, or any specimen of the said apparatus, or of the machines, or of any machine which contained or employed substantially, or at all the invention or any invention covered by said letters patent, or that it infringed upon the exclusive

rights, or upon any rights of the complainant, and the said defendant denies that it intends to or that it will either make, or use, or cause to be made or used, numbers of the specimens, or any specimen of the apparatus described in said letters patent, whether it is restrained from so doing by an injunction or not, defendant denies that it has ever made or used, or sold, or that it has intended, or threatened to either make, construct use or sell, at any time or place the said patented improvements or any of them, or any specimens thereof, and denies that it has infringed upon said letters patent in any way or form whatever, and denies that it ever intended to infringe upon said letters patent, and denies that the complainant either fears, or has any reason to fear that defendant will continue to make, or that it will use said patented improvements, 12 or apparatus, or any specimens thereof, whether it is restrained by an injunction or not.

Defendant denies that the complainant by reason of said alleged infringement has been deprived of large royalties, or of any royalties, or that it has incurred large damages, or any damages whatever, or that the defendant has made large profits, or any profits whatever, by reason of said alleged infringement, and denies that the complainant has incurred or sustained, or that it will incur or sustain large damages or any damages whatever on account of any construction or any use of the said alleged invention, or any specimen thereof by this defendant.

And further answering, the said defendant denies that the said complainant is entitled to the relief or any part thereof in the said bill of complaint demanded. And this defendant prays the same advantage of its aforesaid answer, as if it had pleaded or demurred to the said bill of complaint, and this defendant prays leave to be dismissed with its reasonable costs and charges in this behalf most wrongfully sustained.

WHEATON, KALLOCH & KIERCE,

Solicitors for Defendant.

WHEATON, KALLOCH & KIERCE,

Of counsel for Defendant.

(Endorsed:) Service of the within answer and receipt of a copy thereof admitted this 6th day of December, 1890. Wm. F. Booth, Solicitor for Complainant. Filed 6th day of Dec., A. D. 1890. L. S. B. Sawyer, Clerk.

13

Replication.

Circuit Court of the United States, in and for the Northern
District of California.

PACIFIC CABLE RAILWAY COMPANY,	Complainant,	} No. 10986. In Equity. Replication.
<i>vs.</i>		
CONSOLIDATED PIEDMONT CABLE COMPANY, Defendant.	Defendant.	

This repliant, saving and reserving unto itself all and all manner of advantage of exception to the manifold insufficiencies of the said answer, for replication thereunto saith, that it will aver and prove its said bill to be true, certain, and sufficient in the law to be answered unto; and that the said answer of the said defendant is uncertain, untrue, and insufficient to be replied unto by this repliant; without this, that any other matter or thing whatsoever in the said answer contained material or effectual in the law to be replied unto, confessed and avoided, traversed or denied, is true; all which matters and things this repliant is, and will be, ready to aver and prove, as this Honorable Court shall direct; and humbly prays, as in and by its said bill it hath already prayed.

WM. F. BOOTH,
Solicitor for the Complainant.

(Endorsed:) Service of the above replication acknowledged the fifth day of January, 1891. Wheaton, Kalloch & Kierce, Sols. for Defendant. Filed Jan. 5, 1891. L. S. B. Sawyer, Clerk. By F. D. Monckton, Deputy Clerk.

14

Enrollment.

In the Circuit Court of the United States, Ninth Circuit, North-
ern District of California.

PACIFIC CABLE RAILWAY COMPANY,	Complainant,	} No. 10,986.
<i>vs.</i>		
CONSOLIDATED PIEDMONT CABLE COMPANY, Respondent.	Respondent.	

The complainant filed its bill of complaint herein on the 2d day of October, 1890, which is hereto annexed.

A subpœna to appear and answer in said cause was thereupon issued, returnable on the 3rd day of November, A. D. 1890, which is hereto annexed.

The respondent appeared herein on the 3rd day of November, 1890, by M. A. Wheaton and F. J. Kierce, Esqs., its solicitors.

On the 6th day of December, 1890, an answer was filed herein, which is hereto annexed.

On the 5th day of January, 1891, a replication to said answer was filed herein, which is hereto annexed.

Thereafter an interlocutory decree was duly signed, filed and entered herein, in the words and figures following, to wit:

15 *Interlocutory Decree.*

In the Circuit Court of the United States, Ninth Judicial Circuit, in and for the Northern District of California.

PACIFIC CABLE RAILWAY COMPANY,	Complainant,	} No. 10.986.
<i>vs.</i>		
CONSOLIDATED PIEDMONT CABLE COMPANY,	Defendant.	}

At a stated term, to wit: the February Term of 1892, of the Circuit Court of the United States, in and for the Ninth Judicial Circuit, Northern District of California, held at the courtroom thereof in the City and County of San Francisco, State of California, on Monday, the 29th day of February, 1892:

Present—Hon. Thomas P. Hawley, U. S. District Judge, District of Nevada, assigned to hold and holding the United States Circuit Court for the Northern District of California.

This cause having heretofore come on to be heard upon the bill of complaint of complainant, and the answer of the defendant thereto, and the replication of complainant and proofs, oral and documentary taken and filed in said Court, and being now of record, and having been argued by Wm. F. Booth, Esq., solicitor for complainant, and M. A. Wheaton, Esq., of Messrs. Wheaton, Kalloch & Kierce, solicitors for defendant, and submitted to the Court for consideration and decision; and the Court, having duly considered the same, and being now fully advised in the premises: It is ordered, adjudged and decreed, and the Court doth hereby adjudge and decree as follows, to wit:

16 That those certain letters patent of the United States, granted and issued on the 3rd day of April, 1877, to William Eppelsheimer, numbered 189,204, for improvement in clamps for endless rope railways (being the said letters patent set forth in the bill of complaint), as to claim three thereof, are good and valid in law; that said William Eppelsheimer was the true, original and first inventor of the invention described, claimed and patented in and by the third claim of said letters patent; that the Pacific Cable Railway Company, the complainant herein, is the sole and exclusive owner and holder of said

letters patent for, to and in the whole of the United States and Territories thereof, which lies west of the 106 degree of longitude west from Greenwich, England; that the defendant herein, the Consolidated Piedmont Cable Company, a corporation organized and existing under and by virtue of the laws of the State of California, without the license or consent of complainant, at the City of Oakland and its suburbs, in Alameda County, State of California, since the complainant became the owner and holder of said letters patent, has infringed upon said third claim of said letters patent and the exclusive rights and privileges of said complainant under the same; that is to say by making and using clamps or grips for endless rope railways containing the invention and improvement described in and by the said third claim of said letters patent as charged in the bill of complaint.

It is further ordered, adjudged and decreed that the complainant herein does have and recover of and from said defendant, the Consolidated Piedmont Cable Company, a corporation as aforesaid, the gains, profits and advantages which it has made or received, or which have arisen or accrued to it from or by reason of the infringement aforesaid; and also, any and all damages which the complainant has suffered or sustained from or by reason of said infringement, together with costs of suit.

And it is further ordered, adjudged and decreed that the case be referred to S. C. Houghton, Esq., the standing Master in Chancery of this Court, to ascertain, take, state and report to this Court an account of the number of the clamps or grips for endless rope railways made and used by the said defendant containing the invention claimed and patented in and by the third claim of said letters patent, and also the gains, profits and advantages which the said defendant has made or received, or which have arisen or accrued to it from and by infringing upon the said third claim of said letters patent, and also the amount of damages which the complainant has suffered and sustained from and by reason of said infringement.

It is further ordered, adjudged and decreed that the complainant have the right to cause an oral examination, under oath, of the officers, directors, agents, servants and employes of the said defendant corporation and each of them, and any other witnesses necessary to take said accounting, and also the right to inspect and to have produced before the Master all books, vouchers, contracts, papers and other documents belonging to or in the possession of or under the control of said defendant, showing, or tending to show, or containing any evidence bearing on any matters or things material to the accounting.

It is further ordered, adjudged and decreed that the said defendant corporation, its agents, servants, workmen, employes, officers and directors be and they are hereby forever
 18 perpetually enjoined and restrained from making, using or selling, or offering for sale, any clamps or grips for endless rope railways containing the invention or improvement covered and patented in and by the third claim of said letters patent and from infringing said claim in any manner whatever.

(Signed,)

HAWLEY,
Judge.

(Endorsed:) Filed and entered March 3, 1892. L. S. B. Sawyer, Clerk.

19 *Certificate to Enrollment.*

Whereupon said pleadings, subpœna and interlocutory decree are hereto annexed, said decree being duly signed, filed and enrolled, pursuant to the practice of said Circuit Court.

Attest, etc.

[SEAL.]

L. S. B. SAWYER, *Clerk,*
 By W. B. BEAIZLEY, *Deputy Clerk.*

(Endorsed:) Enrolled Papers. Filed March 3, 1892. L. S. B. Sawyer, Clerk, by W. B. Beaizley, Deputy Clerk.

20 *Opinion.*

In the Circuit Court of the United States, in and for the Ninth Circuit, Northern District of California.

The HON. T. P. HAWLEY, Judge.

PACIFIC CABLE RAILWAY COMPANY, }
vs. } No. 10,986.
 CONSOLIDATED PIEDMONT CABLE COMPANY. }

MONDAY, February 29th, 1892.

THE COURT. (Orally)—This is a suit in equity for the infringement of letters patent No. 189,204, dated April 3rd, 1877, granted to William Eppelsheimer, for an improvement in clamp apparatus for tramways or street railways, in which an endless cable is used as the motive power.

This patent has seven claims, only one of which is claimed to be infringed, viz.: claim 3, which reads as follows:

“The combination, with the shank E, as described, of the “hinged clamping-jaws e”, together with the operating slide F, “its cross bar f, and bearing rollers f, as and for the purpose “specified.”

To determine what particular thing is patented, it is the duty of the Court to ascertain the peculiar structure or device described in the patent as embodying the patentee's invention; the mode of operation introduced and employed by the patented device; the result attained by means of this mode of operation; whether or not the specification of the claim covers the mode of operation by which the result is attained.

21 Looking at and reading from the specification, it is stated "the cable gripping device is constructed as follows: In an aperture extending longitudinally through the shank E, is arranged the slide bar or rod F. Upon the lower end of the shank E, are hinged the jaws e^3 , between which, in suitable semi-circular recesses or channels b , on their inner faces, the cable is grasped. The outer faces of these jaws are inclined outwardly from the hinged joint to their lower edges, as shown at e^4 , Fig. 3, and upon these faces, are arranged to bear frictional rollers f , which are mounted on axles, f' , arranged above the jaws, and fixed in, and carried by a cross-piece, f^2 , which is fixed on the lower end of the slide F. e^5 is a pin set in one of the eye-pieces of the hinge-joint of the jaws, and projecting above one of the said friction-rollers f ." * * * "The shank is lowered until the rollers or pulleys e^2 rest upon the cable, and the rollers or wheels e rest on the track or rail e' . the slide F, is now forced downward in the shank E, and, by means of the pressure of the rollers f on the outer faces of the jaws e^3 , the jaws are closed upon the cable and gripe it tightly, while the rollers g or H support and guide the cable to the jaws. The truck or car is thus set in motion; and, as the gripping device moves along with the cable it encounters in its progress the lower pulleys d and the upper pulleys d' ."

It will be seen from what I have read from the specifications that if the slide bar F be forced down, the cross-piece f^2 , at its foot will be moved down also. Then, as the rollers f are carried by the cross-piece, they will move down, and as they bear on the outer surface of the jaws, and are moving down in vertical planes, it is evident that they must force the jaws inwardly towards each other, said jaws swinging on their common hinge bolt above. Thus the jaws are closed to grasp the cable between them in the opening b' . To open the jaws again the patent discloses the following means: A pin shown in Fig. 1, and lettered e^5 , is connected to one of the hinge eyes of the jaws and projects above one of the rollers f . These pins are better shown in model, complainant's Exhibit B. By looking at this model, it will be seen that when the slide bar F is raised and the rollers f are thereby lifted, one of these rollers of each jaw will bear up under the pin e^5 just above it, and by raising said pins will positively swing the jaws open and release the cable.

There are five elements of this combination claim: 1st. Shank E; 2d. Hinged clamping e^3 ; 3d. Operating slide F; 4th. Its cross-bar f^2 ; 5th. Bearing rollers f .

I am of opinion that these elements or their equivalents are found in defendant's grip. There is in fact no serious contention on the part of the defendant except as to the 5th element of friction rollers.

The 5th element of the patented combination is the bearing-rollers f . These are carried on the ends of the cross-bar of the operating slide, and they bear down on the jaws to close them, and they bear up on pins connected with and forming part of the jaws to open them. The 5th element of defendant's grip, is the loose pins. These are cylindrical pieces of metal. They are carried by the ends of the cross-bar of the operating slide, and they are fitted loosely in holes in the outer portions of the jaws. They bear down in these holes to close the jaws, and they lift up in the holes to open the jaws. These loose pins working loosely in the holes of the jaws, are in my judgment, the mechanical equivalents of the friction-rollers f of the patented combination, which bear down on the jaws to close them, and bear up on the pieces or pins fixed to the jaws, to open them.

Moreover the defendant's grip effects substantially the same result, in substantially the same way as the complainant's grip.

In this case, from all the testimony, I am satisfied that the complainant is entitled to a liberal construction of the patent, and to the doctrine of equivalents.

The complainant is entitled to the usual decree. Counsel for complainant will prepare and submit the same to the Court.

(Endorsed:) Delivered in open Court February 29, 1892. L. S. B. Sawyer, Clerk, by W. B. Beazley, Deputy Clerk.

24

Caption to Depositions.

In the Circuit Court of the United States for the Ninth Judicial Circuit, in and for the Northern District of California.

PACIFIC CABLE RAILWAY COMPANY,	Complainant,	} In Equity.
<i>vs.</i>		
CONSOLIDATED PIEDMONT CABLE COMPANY,	Respondent.	}

Be it remembered, that on the twelfth day of February, A. D. 1891, and on the several days thereafter to which the examination was regularly adjourned, as hereinafter set forth, at my office, room 57, in the United States Appraisers' Building, on the northeast corner of Washington and Sansome streets, in

the City and County of San Francisco, State of California, before me, S. C. Houghton, Examiner in Chancery of the Circuit Court of the United States for the Ninth Circuit and Northern District of California, personally appeared the several witnesses whose names are hereinafter set forth, who were produced and examined on behalf of the respective parties to the above entitled cause.

W. F. Booth, Esq., appeared as counsel on behalf of complainant, and M. A. Wheaton, Esq., as counsel on behalf of Respondent.

Following is a record of the proceedings:

25 *Deposition of Wm. H. Smyth.*

THURSDAY, February, 12, 1891.

Present: Mr. Booth, of counsel for complainant; Mr. Wheaton, of counsel for respondent.

(Complainant introduces in evidence Patent Office copy of specifications and drawings of the United States Letters Patent No. 189,204, granted April 3, 1877, to W. Eppelsheimer, for improvement in clamps for endless rope railways. Marked "Complainant's Exhibit A.")

(It is agreed by both complainant and respondent that said Patent Office copy may be received in evidence with the same force and effect as the original letters patent.)

(It is admitted as a fact, by both complainant and respondent, that the title to the letters patent sued on in this case is in complainant, as alleged in the bill.)

Mr. BOOTH: I will state that our claim of infringement in this case is confined to Claim 3 of the patent "Exhibit A."

(Complainant also introduces in evidence model of the grip described in complainant's patent sued on, showing so much of the grip as is included in the claim thereof claimed to be infringed in this suit. Marked "Complainant's Exhibit B.")

Examination-in-Chief of WILLIAM H. SMYTH on behalf of complainant.

By Mr. BOOTH:

Q. 1.—State your name, age, place of residence and occupation.

26 A. My name is William H. Smyth, my age is thirty-five years, I reside in San Francisco, and am by occupation mechanical engineer.

Q. 2. Mr. Smyth, did you ever examine the construction of the respondent's cable road, and their devices, in Oakland, California, and vicinity?

A. I did.

Q. 3. Did you examine the grip used by the defendant in that road?

A. I did.

Q. 4. Before the commencement of this suit?

A. Yes.

Q. 5. Have you prepared a model which will show the construction and operation of respondent's grip?

A. I have, and that model I now produce.

(The model last above referred to is here introduced in evidence by complainant, and marked "Complainant's Exhibit C.")

(It is admitted as a fact, by both complainant and respondent, that the model "Exhibit C" is a correct model of the grip made and used by the respondent in its road prior to the commencement of this suit.)

Q. 6. Will you describe the construction and operation of the grip represented by that model "Exhibit C?"

A. The grip consists of a shank that passes through the slot to which are hinged two gripping jaws. A sliding bar passes down through the center of the grip-shank, having a cross-bar at its lower end which operates the grip jaws to open and close them by pressure.

Q. 7. What is the connection between the cross-bar of the sliding-bar and the jaws?

A. A pin.

27 Q. 8. Is there a pin on each side?

A. A pin on each side of the cross-bar connecting each jaw to it.

Q. 9. What is the relative position of these pins with respect to the central pin which forms the hinged joint?

A. They are approximately on a line, or they are on a line at a part of their motion.

Q. 10. That is, at that part of their motion they are in the same straight line?

A. In the same horizontal straight line.

Q. 11. How is the cross-bar connected with the sliding-bar with respect to rigidity?

A. It is a part of it.

Q. 12. That is, it is rigidly connected to it?

A. Yes.

Q. 13. What is the plane of movement of the cross-bar?

A. Vertical.

Q. 14. What is the plane of movement of the jaws?

A. On an arc with the pin of the hinge as a center.

Q. 15. How is it possible therefore for the jaws moving on an arc to be operated by the cross-bar moving in a vertical plane, the two being hinged together?

A. If the joints were perfect it would be impossible. There must be lost motion in the connection.

Q. 16. Will you explain a little further why it would be impossible if the joints were perfect?

A. The sliding plate moves in a right vertical line, and the hole in the jaw moves in a curved line, and a pin passes through these two holes, that is, the hole in the cross-bar of the sliding plate and the hole in the hinged jaw. If the joint were perfect they would necessarily have to work together—go down together, but the straight movement of the sliding plate
28 would prevent the curved direction of the hole in the hinged jaws, and in order that the hinged jaws should work, the distance apart of the two holes in the cross-piece of the sliding plate must vary.

Q. 17. But as the jaws do work with this connection, what is the reason for it?

A. The hole in the jaws is made large enough for a loose pin to work loosely in and permit of sufficient play to allow of the motion.

Q. 18. In what way, if any, does this loose pin work upon the hole in the jaws, which you say must be made sufficiently larger than the pin to permit of this working?

A. It works as a roller.

Q. 19. On what portion of the hole does it work?

A. On the inner curved surface.

Q. 20. And by working on this inner curved surface it presses the jaws together.

A. Yes.

Q. 21. Now, Mr. Smyth, look at the model "Exhibit B," which is the model of complainant's grip, and briefly describe its construction and operation?

A. The grip consists of a shank to which gripping-jaws are hinged, and having a sliding plate with a cross-bar at the lower end, the ends of which press upon the outer surface of the gripping-jaws to close them. A pin is attached to each of the jaws in the hinge, which passes above the ends of the cross piece of the sliding plate, and by means of which pin the jaws are opened.

Q. 22. What, in that grip as represented by that model, is secured upon the ends of the cross-bar?

A. Rollers.

Q. 23. What do those rollers do?

29 A. They press upon the jaws and force them together.

Q. 24. How do they open the jaws.

A. By pressing upward upon that part of the jaw which is represented by the pin.

Q. 25. What is the relative position of the points of bear-

ing of the rollers on each side of the jaws and the center or hinge pin of the jaws?

A. At one point in their motion they are in a straight horizontal line.

Q. 26. In what kind of a plane do the rollers move bodily?

A. In a vertical plane.

Q. 27. In what kind of a plane do the jaws move?

A. In a curved plane.

Q. 28. Why is it possible then in this grip represented by the model "Exhibit B" that the jaws moving in a curved plane can be operated by the rollers moving in a vertical plane?

A. Because the sides of the jaws are beveled.

Q. 29. What kind of connection is there between the rollers and the jaws, with respect to rigidity or looseness?

A. It is a loose connection.

Q. 30. What would be the effect by wear of the rollers upon the outer surfaces of the jaws in that grip?

A. It would curve them. It would make them concave.

Q. 31. If the pin which bears upon the upper surface of the roller were continued around said roller and joined to the outer surface of the jaw at a point below the roller what would you then have?

A. A hole or loop.

Q. 32. The roller would then be in this hole or loop, would it not?

A. Yes.

30 Q. 33. Why isn't it necessary to make such a complete hole or loop?

A. Because the roller never works on the outer surface of a hole to operate in the manner in which this grip of complainant's works.

Q. 34. Now, turning to the model "Exhibit C," the model of defendant's grip, upon what portion of the hole would the free pins work?

A. On the side of the hole nearest to the hinge, the inner surface of the hole.

Q. 35. Mr. Smyth, what is this model which I now hand you, and for what purpose was it prepared, and by whom?

A. It is a diagrammatic model prepared by myself to illustrate the similarity of the grips of the defendant and complainant.

(The model last above referred to is introduced in evidence, and marked "Complainant's Exhibit D.")

Q. 36. Explain that model, Mr. Smyth, and point out in what manner it shows the similarity between complainant's and defendant's grip?

A. On that side of the model upon which the operating lever is placed, and at the lower end of the grip, is the shape and

contour of the grip of the defendant, the hinged joints of the jaws and of the jaw connection with the cross-bar being correctly placed as used in their grip. But the hole in the cross-bar, and also in the grip, are made very large, exaggerated, so that the pin which would represent the operating pin of that grip does not touch the sides of either the holes in the jaw or

the sliding plate. On the opposite side of the model is
31 shown the grip of the complainant, with its cross-bar and pressure-rollers. Both sides of the grip, both that representing the grip of the defendant and that representing the grip of the complainant, being operated by the pressure-rollers on the side of the grip representing the grip of the complainant. The pins on which the rollers are journalled being the same which project through into the enlarged holes of the defendant's grip.

Q. 37. What was the reason for making both sides of the grip operated by the pressure-rollers on one side?

A. To show that the pin in the defendant's grip acted precisely the same as the rollers in the complainant's grip.

Q. 38. What is this model which I now hand you, and state the object in making it, and by whom made?

A. It is a diagrammatic model made by myself to illustrate the action of the pins or rollers in the cross-foot of the grips of both complainant and respondent heretofore explained and described, and to show that it is merely a question of position of the bearing points as to what side of the opening of the jaw shall be on the grip, which is illustrated by moving one of the pins on the cross-bar into a lower slot than that in which the pin on the other end of the cross-bar moves.

Q. 39. Now, Mr. Smyth, put both pins on the cross-bar in the upper slots. What is the character of the movement that you will then get?

A. Similar to that of defendant's grip.

Q. 40. What is the extent of the movement of the pins in the slots, great or small?

A. It is quite small.

Q. 41. Now, Mr. Smyth, if you will put both pins into
32 the lowermost slots, what is the character of the action then?

A. The pins in this case travel further than in the case last referred to, and on an inclined surface.

Q. 42. What is the object of the intermediate grooves?

A. To show intermediate positions, and also to show that by having one of the pins in one of these intermediate slots and the other pin in the upper slot on the other side, the opening of the jaw can be placed on one or the other side of the center.

(The model last above referred to is introduced in evidence by complainant, and marked "Complainant's Exhibit E.")

Cross-Examination of WILLIAM H. SMYTH.

By Mr. WHEATON:

X.-Q. 1. In this model, "Exhibit E," are the movements of the jaws the same when one of the pins in one of the jaws is put in the upper slot, while the other pin in the other jaw is put in the lower slot?

A. No.

X.-Q. 2. When the pin is put in the lower slot, does it then bear upon an incline in the lower side of the slot which is similar to the incline on the outside of the jaw in complainant's grip?

A. The model, "Exhibit E," is merely diagrammatic. It is not made with any particular reference to the inclines shown in the complainant's model.

X.-Q. 3. Just please answer the question.

X.-Q. 4. (X.-Q. 3 repeated.)

A. No.

X.-Q. 5. Is not the lower slot in which said pin moves placed upon an angle which very nearly corresponds to the angle on the outside of the jaws in complainant's grip?

A. No; it is not. The angle of the slot in the model, "Exhibit E," points directly to the center of motion of the jaws, and in the complainant's grip the angles are tangent to the diameter of the hinge.

X.-Q. 6. Still it is a fact that in the model, "Exhibit E," the pin, when placed in the lower slot inclosing the jaws, presses upon the incline?

A. Yes; that is a fact.

X.-Q. 7. And it is also the fact that when the opposite pin is placed in the upper slot of the opposite jaw, that it presses down vertically and much more nearly at right angles with the slot?

A. Yes.

X.-Q. 8. What difference does it make in the motion of the two jaws that the pin in one case is in the inclined slot and in the other in the horizontal slot?

A. The jaw in which the pin works in a more inclined slot moves through less space with a given vertical movement of the pin than in the other case.

X.-Q. 9. Is it a fact well recognized in mechanics that greater motion is obtained at the expense of power, and that power is obtained at the expense of motion?

A. Under what circumstances, Mr. Wheaton?

X.-Q. 10. Under all circumstances in which there is a given power supplied for the obtaining of motion.

A. The greater the motion the less the power, unquestionably.

X.-Q. 11. Then which jaw would press the harder upon the rope, the one that had a less motion, or the one that had a greater motion?

A. The one that had a less motion.

34 X.-Q. 12. Then if inclines are used upon both jaws and a given pressure supplied to the pins which press the jaws down, the jaws will clasp the rope with greater power than would be the case if such inclines were not used, will they not?

A. Yes.

X.-Q. 13. In the complainant's grip there is an absolute power gained or obtained then for grasping the rope by the jaws by having the outer surface of those jaws inclined, and the downward pressure applied to those inclines, is there not?

A. I don't think so. You mean, of course, over the other grip?

X.-Q. 14. No, I mean in that grip.

A. Oh, excuse me.

X.-Q. 15. (X.-Q. 13 repeated).

A. There can be no power gained or obtained. All the power there is there, is what a man puts into it.

X.-Q. 16. Have you made any measurements and calculations so that you know how the amount of vertical motion of the shanks compares with the amount of horizontal motion of the jaws which grasps the rope in the complainant's grip?

A. No, I have made no such calculation.

X.-Q. 17. Will you please do so, using the model of the complainant's grip, and state how much up and down motion there is to the vertical shank, when the model is moved to its largest extent?

A. The model shows half an inch of movement of the vertical sliding plate for three-quarters of an inch of opening of the jaw.

X.-Q. 18. Whereabouts did you measure across the jaw to get three-quarters of an inch?

35 A. From the point where they come together when they are closed.

X.-Q. 19. Are the jaws three-quarters of an inch across when you measured them?

A. They were when I measured them. They are now a sixteenth of an inch short of that.

X.-Q. 20. Now, when the jaws are pulled up so that they measure three-quarters of an inch across the lower opening, how much does the vertical shank move down again before it commences to press the jaws together?

A. Just exactly an eighth of an inch.

X.-Q. 21. That leaves three-eighths of an inch of vertical motion of the sliding bar to open and close the jaws three-quarters of an inch?

A. Yes. That is to say, the movement of the sliding bar is just one half the movement of the jaws.

X.-Q. 22. When the jaws are wide open their upper faces approach more towards a horizontal than they do when the jaws are closed, do they not?

A. They do.

X.-Q. 23. Then, as the jaws close around the rope, when they are the nearest together, is the power which presses the jaws against the rope greater than it is when it first commences to move the jaws together?

A. Slightly, I should say.

(A recess was here taken, in conformity with agreement of counsel, until two o'clock this afternoon.)

THURSDAY, February 12, 1891—afternoon.

Present: Mr. Booth, of counsel for complainant; Mr. Wheaton, of counsel, for respondent.

36 Cross-examination of WILLIAM H. SMYTH. (Continued.)

By Mr. WHEATON.

X.-Q. 24. In the jaws which are shown in the model of complainant's grip, is not the incline of the face of the jaws much further from a perpendicular than is the incline on the faces of the jaws shown in the patent "Exhibit A?"

A. They were intended to be approximately the same.

X.-Q. 25. As a matter of fact, is not the incline in the model "Exhibit B" very much greater from a perpendicular than the inclines shown in the jaws of Figure 2 of the drawings of the patent "Exhibit A?"

A. No, not very much greater. I cannot detect the difference by comparing the model with the drawing of the patent referred to.

X.-Q. 26. Please apply a sector to Figure 2 of the drawings of the patent, and state what the angle from a perpendicular is from the outer faces of the jaws there shown?

A. The drawing shows the angle of the outer surface of the jaw to be twelve degrees from a perpendicular, and the outer surface of the jaw in the model "Exhibit B" is at an angle of fifteen degrees from a perpendicular, the difference in angle being three degrees, or a difference of three three hundredth and sixtieths, or a difference approximately of less than one per cent.

X.-Q. 27. What do you mean by "less than one per cent?"

A. That three three hundredth and sixtieths is equal to less than a fraction of one one hundredth.

37 X.-Q. 28. Do you take into consideration the number of degrees variation from a perpendicular in both cases?

A. Yes.

X.-Q. 29. Is not the difference the same as four to five?

A. I don't see how.

X.-Q. 30. Well, isn't it the difference of twelve to fifteen, which by dividing by three would be the same as four to five?

A. No. We are taking now the angle of the jaw from a perpendicular line.

X.-Q. 31. And in the patent it shows an angle of twelve degrees from a perpendicular, while in the model it shows an angle of fifteen degrees from a perpendicular, doesn't it?

A. That is correct.

X.-Q. 32. Then the angles in the two cases are the same as twelve to fifteen from a perpendicular, are they not?

A. Yes, sir.

X.-Q. 33. And that is the same ratio exactly as four is to five, is it not? That is, dividing twelve by three makes four, and dividing fifteen by three makes five?

A. Yes, sir.

X.-Q. 34. Then that angle in the model "Exhibit B" is one quarter greater than the angle in the patent, is it not?

A. Yes, sir.

X.-Q. 35. That makes that angle of the model twenty-five per cent. greater than the angle shown in the patent drawing, does it not?

A. It is twenty-five per cent. of the angle shown in the patent greater.

X.-Q. 36. Now, as the rollers press down upon the outside of those jaws, it is like pressing upon the two sides of a wedge, isn't it?

A. Yes, sir.

X.-Q. 37. Now, is it not a fact that the less the incline from a perpendicular that the faces of those jaws are, the greater power will be obtained, from the fact that the wedge is sharper, or inclines less, as the rollers are pressed down upon those faces with any given power?

A. That infers a comparison, and I don't know what you are comparing it with.

38 X.-Q. 38. I am comparing the lesser inclines upon those same jaws with greater angles upon those same jaws, and inquiring whether it is not true that the lesser those angles are from a perpendicular the more power will be obtained for press-

ing the jaws together, with a given amount of power applied to the lever above?

A. The amount of power obtained from those jaws will be precisely the same as the amount of power applied to the lever, under any circumstances.

X.-Q. 39. The amount of power applied to the lever will be the amount of power with which the rollers are forced downward, will it not?

A. Yes.

X.-Q. 40. As those rollers are forced downwards the power applied to them is a vertical power only, is it not?

A. It is vertical motion.

X.-Q. 41. Well, isn't it a vertical movement of the power only?

A. It is power applied through a vertical movement.

X.-Q. 42. Now, when those rollers are applied to force those jaws together, the vertical motion of the rollers is converted into a circular motion for the jaws, is it not?

A. Yes, sir.

X.-Q. 43. And that circular motion of the lower part of the jaws when they come against the rope is practically a horizontal motion, is it not?

A. Yes.

X.-Q. 44. Now, in converting that vertical movement of the rollers into a horizontal pressure upon the jaws, is there not a power obtained by virtue of the wedge-shape which is formed by the two faces of the jaws?

A. There is no power obtained except what is put into the mechanism by some extraneous motor.

39 X.-Q. 45. If the faces of those jaws were perpendicular, and they were no wider than the space between the two rollers, the rollers would move up and down on them, would they not, without moving the jaws at all?

A. Yes, sir.

X.-Q. 46. Now, suppose there would be a very slight incline so that the rollers would move those jaws the hundredth part of an inch while the rollers moved up and down a full inch, and suppose further that the rollers were pressed downward with a vertical force of one hundred pounds, would they not press the jaws together with a great deal more power than they would if the incline was such that the jaws would move sideways an inch instead of the one hundredth part of an inch?

A. They would simply press the jaws together with a power equal to one hundred pounds moving through one inch.

X.-Q. 47. I will put it in another form. Suppose that the incline on the faces of those jaws was one quarter of an inch horizontally to one inch perpendicular, and the rollers were

held down opposite the rope-opening with a weight of one hundred pounds vertical pressure, how much power would it require to force those jaws apart in a horizontal direction, so as to make those rollers travel up on that incline? Just answer that question, making no allowance for friction.

A. You must tell me how much work you are going to accomplish before I can tell you how much power it will require?

X.-Q. 48. The proposition supposes a given perpendicular pressure upon those rollers constantly applied. It is certain that power enough, not making any allowance for friction, applied to force those jaws apart horizontally, and constantly applied, will make those rollers travel upward on the incline mentioned. Can you tell how much such horizontal power would be?

40 A. A power equal to one hundred pounds moving through the distance in which the rollers move.

X.-Q. 49. Suppose those angles were at an angle of forty-five degrees, and the rollers were held down upon them with a vertical pressure of one hundred pounds, or fifty pounds upon each roller, wouldn't that just balance a horizontal pressure of one hundred pounds, or fifty pounds to each roller, so that the rollers would move up and down on that incline with only just power enough applied to overcome their inertia and the friction?

A. I must have some explanation about that proposition, Mr. Wheaton. Are there two powers applied, one horizontal and the other to the rollers?

X.-Q. 50. Yes. There is a vertical pressure on the rollers of fifty pounds, and a horizontal pressure drawing the rollers towards each other of fifty pounds to each roller.

A. I am afraid I will have to give it up, Mr. Wheaton. I don't know what the resultant of those two forces would be, one force applied horizontally and the other vertically, and then a third at the bottom to force the rollers apart. Now, what the resultant of those three forces would be I can't tell you.

X.-Q. 51. Well, when that angle was increased from a perpendicular so that it very nearly approached a horizontal, it would require less power to draw those weighted rollers towards each other than it would when the angle was much steeper, wouldn't it?

A. The power required to move those rollers would be equal to a given force moving through the distance in which the rollers move. If there was a pressure of one hundred
41 pounds upon the rollers, it would be a force of one hundred pounds moving through the distance in which the rollers move.

X.-Q. 52. Suppose a wagon was loaded with a ton of iron,

it would not require a ton of pulling in a horizontal direction to draw that load over a level road, would it?

A. No, certainly not.

X.-Q. 53. Suppose that wagon stood on a hill that inclined forty-five degrees, the wagon and its load weighing just a ton, how much draft in a horizontal direction towards the center of the hill would it require to balance that wagon and keep it from running down the hill?

A. I suppose about half the weight of the load of the wagon.

X.-Q. 54. Suppose instead of the hill being at an angle of forty-five degrees it was at an angle of sixty-seven and a-half degrees from a perpendicular, how much weight would it then require, drawing towards the center of the hill, to balance the wagon and keep it from running down?

A. The hill is supposed to be sixty-seven and a-half degrees of angularity.

X.-Q. 55. From a perpendicular?

A. The weight required to balance it would be proportional to the distance moved through by the counter-balancing weight as compared to the vertical movement of the load, leaving friction out of consideration.

X.-Q. 56. The question supposes the wagon to be just balanced, so that it will not move in any direction. Now, if that wagon with its load weighed just a ton, and the angle of the hill was sixty-seven and a-half degrees from a perpendicular, wouldn't five hundred pounds, or a quarter of a ton, drawing the wagon towards the center of the hill, just balance
42 it so it would not move in either direction?

A. No, it would not.

X.-Q. 57. Why not.

A. Because an angle of sixty-seven and a-half degrees is more than a-quarter of a right angle.

X.-Q. 58. Isn't it just a-quarter of a right angle measuring from a horizontal, and three-quarters of a right angle measuring from a perpendicular?

A. Not if I understand what a right angle means.

X.-Q. 59. A right angle is an angle of ninety degrees, is it not?

A. Precisely.

X.-Q. 60. A quarter of ninety is twenty-two and a-half, is it not?

A. Yes, sir.

X.-Q. 61. Then, if you take twenty-two and a-half degrees off from ninety doesn't it leave sixty-seven and a-half degrees?

A. Yes, sir, but on the wrong side of the cliff. The hill will hang over. It will be an overhanging cliff, if I understand your proposition.

X.-Q. 62. Suppose you start from a given point and draw a line downward at an angle of twenty-two and a-half degrees from a horizontal, would that make an overhanging of any kind?

A. My reply to the last question was to a different proposition entirely.

X.-Q. 63. What is the object of having the outer faces of the jaws in the complainant's grip on an incline?

A. For the pressure rollers always to bear against.

X.-Q. 64. What is the object of the pressure rollers?

A. To force the jaws together.

X.-Q. 65. In the defendant's grip there are no pressure-rollers, are there?
43

A. Well, no. There is a rolling-pin, or shaft.

X.-Q. 66. Well, I didn't ask for rolling-pins, nor the shaft on which the rollers turn, but simply for the pressure-rollers themselves. Are there any rollers in the defendant's grip?

A. Is it correct for me to ask a question? I would like to know what you mean by "rollers?"

X.-Q. 67. I mean by "rollers," round wheels such as you have referred to as rollers in the complainant's grip. Treating them as a definition of "rollers," are there any rollers in the defendant's grip?

A. There are no rollers exactly like the rollers in the complainant's grip, but there are long rollers in a similar position in the defendant's grip.

X.-Q. 68. Are there any inclined surfaces which incline outwards as they descend on the outer faces of the jaws in the defendant's grip?

A. No.

X.-Q. 69. Then is there any opportunity in the defendant's grip for applying rollers upon the outside surfaces of the jaws for pressing the jaws together?

A. I would like, Mr. Wheaton, for you to tell me what you mean by "the outside surfaces" in the defendant's grip.

X.-Q. 70. You know what the outside surfaces of the jaws in the complainant's grip against which the rollers press are, do you not?

A. The rollers press against two surfaces, one which might be called an outside surface, and another which might be called a lower surface, represented by the bottom of the pin.

44 X.-Q. 71. What pin do you mean; the pin that the rollers revolve on?

A. No, the pins which form part of the jaws.

X.-Q. 72. Well, do you mean the center pin around which the jaws partially revolve?

A. No, that pin doesn't form part of the jaws.

X.-Q. 73. Well, what do you mean?

A. I mean the pin which forms part of the jaw. That is as specific as can be.

X.-Q. 74. By "the pin," you refer to the pin which reaches out over the rollers, against which the rollers come in contact while they are separating the jaws, do you?

A. Yes, sir.

X.-Q. 75. Well, leaving that out of the question entirely, you know what the outside surfaces of the jaws in the complainant's grip, against which the rollers press in closing the jaws are, do you not?

A. Yes, sir.

X.-Q. 76. Now, is there any outside surface of the jaws of the defendant's grip which furnishes an opportunity for rollers to be applied to press the jaws together?

A. Precisely an analogous surface to that in the complainant's grip.

X.-Q. 77. What do you mean by "analogous?"

A. Corresponding to.

X.-Q. 78. Whereabouts is it in the defendant's grip?

A. On the inner surface of the hole in which the loose pins revolve or are.

X.-Q. 79. What loose pins do you refer to? I fail to understand.

A. The pins through the interposition of which the sliding-bar moves the hinged jaws.

45 X.-Q. 80. Do you mean the pins which pass through the projections of the jaws and projections of the bifurcated bottom of the sliding plate, and which hinge the jaws to those bifurcated bottoms of the sliding plate?

A. My previous answer perfectly designates the pins that I refer to.

X.-Q. 81. Will you please explain how you could apply the rollers to the inner surfaces which you have mentioned so as to press the jaws together, since you say those inner surfaces are analogous to the inclined surfaces of the complainant's grip against which the rollers press?

A. It has already done so in the pins, the loose pins in the holes.

X.-Q. 82. What do you mean has already done so?

A. A roller has been applied to these surfaces, the curved inner surface of the hole.

X.-Q. 83. About what is the diameter of that pin in a full sized grip?

A. Oh, I don't know. I suppose about seven-eighths of an inch. That is simply my judgment. I don't remember the exact size of it.

X.-Q. 84. Then in your judgment the mere pin which forms the center about which the two halves of a hinge revolve constitutes a roller, does it?

A. If you are referring to the grip and the pin which I have just testified about, the connection between the jaw and the sliding plate is in no wise analogous to a hinge.

X.-Q. 85. In the defendant's grip which you now have before you, do you see the projections upon the lower halves of the bifurcated bottom of the sliding plate, and also the
46 projections on the upper halves of the quadrant jaws which interlock each other?

A. Yes, sir.

X.-Q. 86. Do you also see a pin which goes lengthwise of the jaws through those several projections so as to join them together?

A. Yes, sir.

X.-Q. 87. Now, do those projections, and the pin which joins them together, form a hinge or not, in your judgment as a mechanic?

A. I should not call it a hinge. I should call the method of connecting the jaws to the shank a hinge.

X.-Q. 88. What do you call the shank in the defendant's grip?

A. The stationary portion which passes down through the slot.

X.-Q. 89. Well, do you mean the two outside legs which are attached to the stationary part of the grip, and between the lower ends of which the jaws operate?

A. Yes. That is technically termed the shank of the grip.

X.-Q. 90. What is there about that connection that makes it a hinge, while the connection of the jaws with the bifurcated bottoms of the slide do not constitute a hinge?

A. This is a very peculiar combination of devices, the very action of which is apparently a paradox. The joining of the grip jaws with the grip-shank is a simple ordinary hinged joining.

X.-Q. 91. Have you ever seen that kind of a combination in anything else until you saw it in the defendant's grip?

A. Yes, sir. Any toggles which pass the center line by the lost motion between them would be to a certain extent
47 similar to this.

X.-Q. 92. Do you find any toggles or toggle-joints in the defendant's grip; if so, where are they?

A. No, there are no distinctly toggle-joints, but I say the action of a connection one part of which moves in a right line and the other moving in a curved line would be analogous to a toggle which passes its central point by means of loose motion in the joints.

(Signed) WILLIAM H. SMYTH.

Deposition of Arthur F. L. Bell.

TUESDAY, April 14th, 1891.

Present: Mr. Booth, of counsel for complainant; Mr. Wheaton and Mr. Kierce, of counsel for respondent.

Examination-in-chief of ARTHUR F. L. BELL, on behalf of respondent.

By Mr. WHEATON:

Q. 1. State your name, age, place of residence, and occupation?

A. My name is Arthur F. L. Bell; my age twenty-nine years; I reside in San Francisco, and am by occupation a mechanical engineer.

Q. 2. What position do you hold in the defendant's employ, if any?

A. I held the position of constructing engineer, having charge of all the work of the Consolidated Piedmont Cable Company.

Q. 3. Have you been familiar with the construction of the defendant's cable road, and with its equipment, ever since it first started to build its road?

A. I have, since it first started.

Q. 4. Are you familiar with all the details of the gripping device which it has used?

A. I am. The grip was designed under my supervision.

Q. 5. Are you familiar with the gripping device which is described in the complainant's patent sued on in this case, No. 189,204?

A. I am.

Q. 6. Have you a model of the gripping device as shown in the complainant's patent with you?

49 A. I have, and now produce it.

(Respondent introduces in evidence the model above referred to, which is marked "Respondent's Exhibit 1.")

Q. 7. How does the incline on the sides of the jaws in "Exhibit 1" compare with the incline on the sides of the jaws shown in the patent?

A. It is exactly the same.

Q. 8. How does the incline on the sides of the jaws in complainant's "Exhibit B" compare with the incline on the sides of the jaws shown in the patent?

A. It is a great deal in excess of that shown in the drawing of the patent. The drawing in the patent shows the angle of the inclined planes to be thirteen degrees from a perpendicular on each sides of a perpendicular line, and in "Exhibit B" the angles are twenty degrees on each side of a perpendicular,

making the angles of "Exhibit B" seven-thirteenths more than in the patent drawing. In other words, the angle of the incline planes in complainant's "Exhibit B" is seven degrees greater angle than is shown in the patent drawing, which in itself has the inclined planes on an angle of only thirteen degrees from a perpendicular, and using the thirteen degrees as the basis makes the angle of the complainant's "Exhibit B" seven-thirteenths, or more than fifty per cent. greater than the patent drawing.

Q. 9. How does the angle of the inclines on the face of the jaws in complainant's "Exhibit D" compare with the angle of the inclines on the face of the jaws shown in the patent drawing?

A. The inclined planes on complainant's "Exhibit D" are thirteen degrees from a perpendicular, making them four degrees greater incline than the patent drawing shows.

50 Q. 10. In "Exhibit D" is the apparatus so arranged that it shows the working of the jaws by means of the rollers and inclined planes on the one side, while upon the other it represents the working of the jaws by means of the pins only, without any inclined planes, and without any rollers?

A. No, it is not. It is made with the intention of hiding the true principles upon which the two grips work. A certain position has been found where the pins and the rollers would work most nearly the same results, and this model has been made with the pins and rollers in that position. What is more, the model is of such a poor construction that the inaccuracies due to lost motion, and the model being on such a small scale, would make it almost impossible to detect the different lines upon which the rollers or the pins traveled. By looking at "Exhibit D" on the side which is intended to show the defendant's grip, it will be seen that the pins are not made to touch either the jaws or the cross-bar which is shown in the drawing of complainant's patent and marked "*f*²."

Q. 11. As the defendant's grip is made and used, what is the relative location between the central pin or shaft which connects the two jaws together at their upper ends, and the two pins which work in the cross-piece for moving those jaws up and down?

A. They are approximately on a horizontal line. The movement which the jaws would have causing the outside pins to move as much above that horizontal line as below it. When the grip is new, and the dies which wear on the rope are new, the grip is so designed that these pins would be above the horizontal line drawn through the center of the hinged pin.

51 As the dies wear, and the rope becomes warm, then the outside pins take a position, when they are gripping the rope, below this horizontal center line referred to.

Q. 12. Please look at the drawing now shown you and state what it represents?

A. It represents three diagrams to show the working of the complainant's grip, which diagrams are marked, respectively, "Sketch 1," "Sketch 2," and "Sketch 3;" and also three diagrams to show the movements of the defendant's grip, marked respectively, "Sketch 4," "Sketch 5," and "Sketch 6;" and also a sketch marked "Sketch 7," which shows the position of the pins and their relative location to the sides and bottom of the hole in which these pins work in the grip-jaws.

(The drawing above referred to is introduced in evidence by respondent, and marked "Respondent's Exhibit 2.")

(It is stipulated and agreed, by and between counsel for the respective parties herein, that a tracing of said drawing "Exhibit 2" may be made and substituted in place thereof, and the original withdrawn.)

The WITNESS: (Continuing.) "Sketch 1" of this drawing "Exhibit 2," represents the lower part of complainant's grip, exactly as it is shown in the patent drawings, the size of the rollers and of the jaws being in exact proportion, and it also shows the point on which the rollers bear on the gripping-jaws, the rollers "*f*" bearing on the jaws at a point whose radius is the same from the center of the hinge as the rope is. This arrangement is represented to be gripping an inch and a quarter rope. A red line is drawn through one of the rollers "*f*" to show its exact bearing point upon the gripping jaw, and there is also a red line marked "K L" which meets the first
52 red line referred to, which shows the bearing point of the roller on the gripping-jaw. To show the working of the grip with rollers at different positions I have drawn a line above the three diagrams from which I take all my measurements to the center of the rollers.

Q. 13. Did you make this drawing "Exhibit 2?"

A. No, I didn't make it myself. It was made under my supervision.

Q. 14. When you say you have drawn the line mentioned in your last answer, you refer to the top line drawn on this diagram "Exhibit 2?"

A. Yes, sir; the top line which is directly above the three upper diagrams. By referring to "Sketch 2" it will be seen that the rollers have been moved up one-half of an inch, as can be seen by the distance being marked from the center of the roller to the upper line, which is two and a half inches, where in "Sketch 1" it was three inches. It will be seen that this movement of half an inch up has open the jaws where the rope was to one and five-eighths inches, in other words, the jaws at that point have opened three-eighths of an inch. It

will also be seen that the rollers have rolled up the inclined plane to the distance between the red lines K L and M N, which are marked on the side of the gripping-jaw. These two red lines show that those rollers roll on an inclined plane, and that if the rollers were sliding and did not roll they would have had to slide up. Now, by referring to "Sketch 3" it will be seen that the rollers have been rolled up still another half inch, or in other words, the rollers are an inch higher than they were in "Sketch 1." The position where the rope was in the

53 jaws is now increased to two and three-sixteenths inches from the original one and one-quarter inches, making a movement at this point of fifteen-sixteenths of an inch, for a vertical movement of the rollers of one inch. It will also be seen that the rollers have rolled still further than they did in "Sketch 2;" that is, the distance between M N and O P, or they have rolled a total distance of from line K L to line O P between "Sketch 1" and "Sketch 3." It will be seen that this movement of one inch is what is necessary to allow the rope to drop out of the gripping-jaws. It may further be said that I have not studied out any particular position for these rollers to compare them with the rollers in the defendant's grip, but have started in on the basis of the patent drawing. Now, in referring to sketches "4," "5" and "6" which are represented on the drawing "Exhibit 2," which represents a grip made exactly the same as the defendant's grip, and of almost the same proportion as the defendant's grip, but made so that the distance between the center of the rope and the center of the hinge upon which the gripping-jaws revolve are the same as in the sketches "1," "2" and "3." Also, the bearing point of the pins which move the jaws is on the same radial line from the center of the hinge as the center of the rope is, which is made to correspond to the bearing points of "Sketch 1." There is also a line laid out above sketches "4," "5," and "6" in the same way as was referred to as being above sketches "1," "2," and "3," at a starting point from which to take the measurements for the center of the pins which move the gripping jaws. Now, in "Sketch 4" the centers of these pins are three inches from this line last referred to, and the jaws are supposed to be gripping the rope. Now, by referring to "Sketch 5" the centers of those pins have been raised half

54 an inch, the same way as the centers of the pins which are in the center of the rollers are shown in "Sketch 2," and the jaws have been opened where the rope was to two and a quarter inches, showing that the movement at the point where the rope was is exactly twice the vertical movement of the pins. By referring to "Sketch 6" it will be seen that the centers of the pins have been raised one inch more

than in "Sketch 4," the same way as was done in "Sketch 3," which is directly above it, and instead of an opening of two and three-sixteenths inches where the rope comes, the opening is three and three-sixteenth inches, which is greatly in excess of what would be necessary on any grip, showing that the vertical movement on the defendant's grip does not have to be more than one half of what it is on complainant's grip. Now, in "Sketch 7" we have laid out the different parts of the grip in different colors, and shown the location of the pins in the enlarged holes which are made for them in each gripping-jaw, and in the cross-bar marked " f^2 ." It will be seen by looking at the pins which open the jaws that instead of their bearing on the inside surface of these holes in which they fit when they are gripping the rope, they bear on the lowest point in the hole in the gripping-jaw, and do not bear towards the center of the rope at all, and that they only bear in a vertical plane in every case, unless the grip should be moved so far beyond its limit of movement that the pin would have taken up all the loose motion that has been left for it in the hole, and then it would bear upon the outside surface of the hole, on account of the movement of the center of the pin being in a vertical direction, and the movement of the hole in the gripping-jaw being on an arc, or moving in a circle around the center hinge. In no case would that pin ever bear against the inside face of the hole.

55 In referring to "Sketch 1" it will be seen that the rollers always bear on the face of the jaw nearest the center of the grip.

Q. 15. State whether or not in the complainant's patented grip, the same amount of power being applied for pressing the rollers downward, the compression of the jaws upon the cable is constantly increased?

A. Yes; the pressure against the rope constantly increases in proportion as the rollers move below the center of the hinge.

Q. 16. Please state to what this constantly increasing pressure is due?

A. It is due to the increased leverage gained on account of the bearing points of the rollers as they move down the inclined planes, being further from the center of the hinge and more directly over the center of the rope, as would be shown in "Sketch 1."

Q. 17. What do you mean by being more directly over the center of the rope?

A. That the bearing points of the rollers on the jaws would be on a horizontal line that would pass through the center of the rope.

Q. 18. Is there any such increasing of the pressure obtained from the working of the defendant's grip?

A. There is not.

Q. 19. Is it also a fact that the lower down the rollers descend in the patented grip the more they press the jaws together, and thereby reduce the inclination of the inclined surfaces of the jaws?

A. Yes, sir.

56 Q. 20. Is there a gain of power by this reduction of the inclination of the planes of the jaws?

A. There is a gain in pressure on the rope.

Q. 21. Do you know whether or not there were grips in use on cable roads in San Francisco long before the 3rd day of February, 1877, the date that complainant's patent was applied for?

A. I do know that there were such grips in use on cable roads here prior to that date.

Q. 22. Do you know whether all the prior grips contained the elements which are described in the complainant's patent as the shank "E," and as the operating slide "F," either in the exact form shown in complainant's patent, or any analogous forms, by which the same operation was performed?

A. I do know that they did.

Q. 23. Has it been the case in every instance that there was some kind of a frame that was fastened to the car or dummy so that it could not move up or down, and which carried a part of the gripping device, and within which frame there was a sliding vertical rod of some kind which carried at its lower end the remaining part of the gripping device?

A. It has been.

Q. 24. I now call your attention to complainant's "Exhibit E." When the pins in the cross-bar of "Exhibit E" are in the upper slots of the wings which represent the jaws, what distance will those pins move along the face of those slots in making the lower points of the jaws open and close to the extent of one and a quarter inches?

A. If we start in with the lower parts of the jaws just touching each other, and then move them apart so they are one and a quarter inches apart at the lower extremity of the
57 jaw, the greatest movement that I can detect of the pins, when in the upper slots, is one thirty-second of an inch.

Q. 25. Are the pins, when they are in the upper slot in "Exhibit E," in about the same relative position that the pins are which move the jaws in the defendant's grip?

A. They are.

Q. 26. Now, please change the wings in "Exhibit E" so that the pins will be in the lower slot?

A. I have done so.

Q. 27. While the pins are in the lower slots in "Exhibit E," what distance will they pass along those slots in opening or closing the lower points of the jaws to the extent of one and a-quarter inches?

A. Starting in with the jaws closed at exactly the same points as when the pins were in the horizontal slots, and opening the jaws so that they are one and a-quarter inches apart at their lower extremity, I find that the pins have moved in the slots just three-eighths of an inch, or twelve times the distance that they did when the pins were in the upper or horizontal slots.

Q. 28. In the construction of a full sized grip for practical use, where the pins passed so great a distance along the inclined surfaces of these lower slots, would it be an advantage to put any friction rollers to turn on those pins, while it would not be nearly so much of an advantage to have the friction rollers on the same pins when they were moving in the upper or horizontal slots, where their movement along the slot was only one twelfth as much?

A. It would be almost an absolute necessity to use
58 friction rollers in a grip made with this excessive amount of movement of the pins on the inclined surfaces, and there would be no necessity for rollers if a grip designed with the horizontal slots was used.

Q. 29. In the complainant's patented grip, if the pins "*f*" were placed closer together in the cross-bar so as to come in contact with the inclined surfaces of the jaws, and the friction rollers dispensed with, would not the grip work exactly the same as it works with the rollers, excepting only that there would be greater friction, and consequently greater wear where the pins would slide along the inclined surface of the jaws?

A. Before answering that question I will have to say that you cannot get exactly the same movements from two grips if the size of the rollers is different in them. The pins must be of the same size exactly as the rollers, in order to give exactly the same result in the same grip, and if a pin was inserted of the same diameter as the outside of the rollers the movement of the grip would be exactly the same as one with the rollers, except that a great deal of the power of the grip would be absorbed by the friction due to the sliding of the pins.

Q. 30. Now, in the defendant's grip is there any friction roller of any nature or kind used in operating its jaws?

A. There is not.

Q. 31. Is there any use in it for any friction roller?

A. There is not, as no rolling action takes place.

Q. 32. Is there the same number of jaws in the defendant's grip that there is in the patented grip?

A. There is.

Q. 33. Do both of those sets of jaws turn upon a hinged joint near their upper ends?

A. They do.

59 Q. 34. Are both of those sets of jaws in both cases operated by a vertical rod which spreads out at the bottom so as to make a cross-piece?

A. They are.

Q. 35. In both of those grips are there pins which are fastened to the cross-piece, and are connected directly or indirectly with the jaws, so that the downward vertical motion of those pins closes the jaws?

A. There are.

Q. 36. Now, in the patented grip are there the elements of the friction rollers marked "f" in the patent which is not contained in the defendant's grip at all?

A. There are.

(A recess was here taken, in conformity with agreement of counsel, until two o'clock this afternoon.)

TUESDAY, April 14, 1891—afternoon.

Present: Mr. Booth, of counsel for complainant; Mr. Wheaton, of counsel for respondent.

Cross-Examination of ARTHUR F. L. BELL.

By Mr. BOOTH:

X.-Q. 1. In one of your previous answers, Mr. Bell, you have said that in both the complainant's and the defendant's grip there are pins by the downward vertical movement of which the jaws are closed. Will you, looking at the complainant's patent, point out those pins?

A. They are marked "f¹."

X.-Q. 2. Do those pins in the complainant's patent close the jaws by their vertical downward movement?

60 A. They do, by transmitting the power through the rollers.

X.-Q. 3. Do those pins touch the jaws, or could they touch the jaws if the rollers were removed, as shown in complainant's patent?

A. Not unless the grip was re-arranged to conform with a pin of that size.

X.-Q. 4. But those pins "f¹" that you find in complainant's patent do not by their vertical movement close the jaws, do they?

A. Not directly.

X.-Q. 5. Is it not a fact that the rollers mounted upon those pins are the things which close the jaws?

A. They are.

X.-Q. 6. Well then, when you testified that you found in both the complainant's and the defendant's grip pins by the downward movement of which the jaws were closed, you were mistaken, were you not?

A. I was not.

X.-Q. 7. You have just testified that the pins do not close the jaws, but that the rollers close the jaws. Now, suppose you omitted the rollers, leaving the pins as you find them in complainant's patent, would they close the jaws?

A. They would not.

X.-Q. 8. Then you do not find in complainant's patent pins which by their downward movement close the jaws, do you?

A. Not directly.

X.-Q. 9. You find rollers which close the jaws, do you not?

A. Yes; the rollers directly close the jaws.

X.-Q. 10. What are the pins for in the complainant's patent?

A. To transmit the power to the rollers, and also for the rollers to revolve on.

X.-Q. 11. Are they not to carry the rollers?

61 A. Yes; they are to carry the rollers, but unless they transmit the power through the rolls, the rolls would not be of any use.

X.-Q. 12. Then, given in complainant's patent a shank "E," hinged clamping-jaws " e^3 ," operating slide "F," with its cross-bar " f^2 ," and the pins " f^1 ," and with these elements alone, could the jaws be closed as shown by the construction in complainant's patent?

A. They could not, unless the design of the grip were made to conform with that.

X.-Q. 13. You have previously testified, Mr. Bell, that long prior to February 3rd, 1877, the date of the application for complainant's patent, there were grips in use for cable roads. How do you know that, Mr. Bell?

A. Because I saw them operated on the Clay-street road.

X.-Q. 14. When was that?

A. In 1873, I think.

X.-Q. 15. Did you know how they were made at that time?

A. I didn't examine the grips at that time so that I could swear to their exact construction now, but I know that the grips were in operation, and that they were the Hallidie grip.

X.-Q. 16. Well, you were ten years old at that time, were you not, Mr. Bell?

A. Yes, sir; about ten years old.

X.-Q. 17. Do you know of any other grips in use prior to 1877, besides those in use on the Clay-street road?

A. I don't think of any at the present time.

X.-Q. 18. Then the many grips that you have testified to are reduced to those used on the Clay-street road, are they not?

A. They are.

62 X.-Q. 19. Do you know what kind of grip that was, that was used on the Clay-street road?

A. I do.

X.-Q. 20. Well, do you know from a knowledge of it at that time, when it was being used, or simply from what you have heard since that was used at that time?

A. From the general recollection that I have of the grip at that time, and I have every reason to believe there has been no change, now that I do know the construction of the grip.

X.-Q. 21. That there has been no change between what times, do you mean?

A. Between the times of the Hallidie patents, and the grip used originally on the Clay-street hill road.

X.-Q. 22. What kind of a frame did the grips have which were used prior to 1877?

A. A square skeleton frame, I think, consisting of four up-rights terminating in a cross-head above, and there was a combination of two screws above to lower the grip to take the rope, and one to grip the rope for pulling the car after the grip had been lowered on to the rope.

X.-Q. 23. What kind of a slide did they have?

A. They secured their power by a combination of a wedge and a screw above.

X.-Q. 24. Do you know what kind of jaws they had?

A. They had combination rollers and dies for gripping the rope.

X.-Q. 25. How did they work with relation to each other, the two jaws, I mean?

A. I have forgotten.

X.-Q. 26. They were not like the jaws shown in complainant's patent, were they?

63 A. I have forgotten. It is some time since I have seen the grip.

X.-Q. 27. You have spoken heretofore, Mr. Bell, of the rollers "*f*" in the complainant's patent rolling up the incline. Is such an expression as that accurate? Do they roll up the incline of the jaws?

A. I don't know that I understand the sense of that question.

X.-Q. 28. Do not the rollers "*f*" in complainant's grip move vertically, perpendicular?

A. Yes, they do, but the jaws will follow them, so that the operation is the same as if they were rolling up.

X.-Q. 29. Yes, that is very true, but is it correct to speak of the rollers rolling up the incline?

A. I think so.

X.-Q. 30. Is it not true that the reverse takes place; that the rollers do not move on an incline at all, but move perpendicularly while the jaws follow their movement?

A. That is so, but, nevertheless, the action is a rolling action up the incline as the rollers are drawn up and the jaws are forced outward by the spring of the rope itself. The action is a rolling action on the incline.

X.-Q. 31. Is it your understanding of the complainant's grip that the jaws in following the vertical movement of the rollers are moved thereto by the spring of the rope?

A. They are, for a certain percentage of their movement.

X.-Q. 32. Is it your understanding of complainant's patent that that is the way that the grip is opened?

A. That is the operation which takes place until the rollers have moved up vertically far enough to release the pressure of the gripping dies against the rope. After that they would raise vertically and not touch the inclines until they touch the pins which are fastened to the top of the jaws which bear on the top of the rollers.

X.-Q. 33. How can a thing be said to be rolling on an incline which moves in a perpendicular direction?

A. Because the side of the gripping-jaw is an incline, and the rollers necessarily are rolling on an inclined face.

X.-Q. 34. Well, is it not true that the operation which takes place is simply that the rollers moving in a vertical plane are followed up by the jaws opening, and which remain in contact with the rollers as they move vertically?

A. Yes, the rollers do move vertically—the center of the rollers move vertically.

X.-Q. 35. The two rollers "*f*" in complainant's patent as they move upwardly do not converge, do they?. I mean the rollers on each side?

A. The centers of the rollers do not converge.

X.-Q. 36. I am not speaking of any axial or rotary motion of the rollers "*f*," but simply of their bodily movement upwardly. In this movement do the rollers converge?

A. They do not.

X.-Q. 37. Then the contact of the jaws of the grip with said rollers is effected by the jaws following the rollers up, is it not?

A. It is.

X.-Q. 38. The movement of the jaws is in an arc of a circle, is it not?

A. A given point on the jaws is, but the point of contact with the rollers is not.

X.-Q. 39. But any point in the jaws moves through a

65 curved line of some description, in contradistinction to a right line, does it not?

A. Yes, any given point.

X.-Q. 40. Now, Mr. Bell, bearing in mind the bodily movement of the rollers "*f*" and the curved movement of the jaws "*e*³," would there be any sliding contact between said jaws and rollers even if the rollers did not have any axial movement at all; that is to say, did not turn?

A. There would be a sliding movement.

X.-Q. 41. Would not the point of contact between the two points, by reason of their different movement, constantly change both upon the surface of the jaws and the periphery of the supposed rollers; that is, rollers that do not turn?

A. Do I understand that you mean that the jaws traveling on an arc would, and the rollers traveling vertically would or would not cause sliding action?

X.-Q. 42. That was the preceding question, and not the last. You answered that there would be a sliding action.

(X.-Q. 41 repeated.)

A. The jaws would bear on different points of the stationary roller in its vertical movement, but nevertheless there would be a sliding action between the two.

X.Q. 43. Explain the consistency of that answer.

A. In what way?

X.-Q. 44. If there be present a sliding action of the roller upon the jaw, would it not be necessary to effect this action that the same point of the roller should be presented to the contact during the sliding movement?

A. Not at all. A stationary roller having a curved face as it bears upon the incline plane of the jaw at any given point will come in contact with a different incline in its vertical movement, on account of the angle of the incline plane changing to a greater or lesser degree, according to the upward
66 or downward movement of the stationary roller; and what is more, if the stationary roller is to be moved downward it must slide on the incline plane downward, so as to force the jaw on to the rope.

X.-Q. 45. What do you understand by "sliding?"

A. One face bearing on another face and one of the faces moving a greater distance than the other while in contact. I can see no way in which you can get no sliding action there by having the roller "*f*" stationary.

X.-Q. 46. Is it not true that the jaw rolls upon the stationary roller in such a movement?

A. It is not true. The only way you could overcome the rolling action would be to revolve the gripping-jaw around the roller "*f*." There is no possible way that you can use it in

the way it is laid out in "Sketch 1" of the drawing "Exhibit 2" and have no sliding action.

X.-Q. 47. Now, still supposing the roller "*f*" to be a stationary one and having a vertical bodily movement will it not at a certain point in its downward travel form contact with the jaw at the extremity of the horizontal diameter of said roller, providing the movement of the roller be far enough?

A. No, never.

X.-Q. 48. Well, your last answer is based upon the particular shape and width of the jaws in the sketch, is it not?

A. Yes. I am referring to the way that the patent is laid out, and the way these sketches are made.

X.-Q. 49. Suppose the jaw "*e*³" to be so pivoted at its upper end so that it could swing inwardly far enough to bring its outer face into a perpendicular position, wouldn't the roller in such a case, acting on such a jaw, if moved far enough
67 down form contact with the face of the jaw at the extremity of its horizontal diameter?

A. It would, but that case would be impossible because your jaws would have to have perpendicular sides, and there would be no limit to the movement of the rollers, and they would not close or open the grip.

X.-Q. 50. I am not speaking of this grip. I am asking a theoretical question. Now, given the same stationary roller and the same jaw so pivoted as in my last question indicated and following up the roll, is it not a fact that when the roller would be moved upwardly far enough that the jaw following it would in due time form contact with the roller at the extremity of its vertical diameter?

A. Yes, a jaw would.

X.-Q. 51. Now then, has not the jaw moved from the position indicated in the previous question to the position indicated in the last question around the periphery of the roller for a distance of ninety degrees, or a quarter of a circle?

A. It has.

X.-Q. 52. Has not the jaw therefore rolled about that much on the periphery of the roller?

A. It has not rolled. It has had a sliding action while the side of the jaw has been moving from a vertical line to a horizontal line.

X.-Q. 53. Is the contact on the jaw in this movement at the same point all the time?

A. No, it is not. There is a rolling and sliding action taking place at the same time.

X.-Q. 54. Now, Mr. Bell, in the defendant's grip what kind of an action has the pins in the holes of the jaws, a rolling or a sliding action?

A. Neither.

68 X.-Q. 55. Do you mean by that, that they do not move at all upon the edges of the holes in the jaws?

A. I mean that they would have a rocking motion.

X.-Q. 56. Bearing upon what?

A. Rocking from a point on the top of the roller to a point on the bottom of the roller.

X.Q. 57. Bearing upon what during this rocking movement?

A. Bearing on the top of the holes in the cross-arm and on the bottom of the holes in the jaws.

X.-Q. 58. What distinction do you make, Mr. Bell, between a rolling action and a rocking action?

A. I mean that the pins move on no definite center, and they do not have to be round. A thin plate standing vertically, or a thin bar of infinitesimal thickness, but whose width equalled the diameter of the hole, would answer the purpose just as well as a round pin. The reason that a round pin was put there was because it was cheaper to construct a grip in that way than to put any other form of bar there.

X.-Q. 59. Does the pin in defendant's grip bear constantly upon the same point in the hole of the jaw during the operation of opening and closing the jaws?

A. No, it does not.

X.-Q. 60. How does it get from one point of contact to another by rolling, or by sliding?

A. It rolls or rocks.

X.-Q. 61. Now, Mr. Bell, are you perfectly certain of your testimony heretofore given to the effect that those pins do not under any circumstances, in the defendant's grip, bear against the inner edges of the holes in the jaws?

A. I am.

69 X.-Q. 62. If they did bear against the inner edges of the holes in the jaws, a grip such as defendant's grip, and which had been in use, would probably show it, would it not?

A. It would.

Mr. BOOTH: Counsel for complainant hereby requests counsel for defendant to produce before the Examiner in Chancery one of the defendant's grips which has been in actual use for sufficient time that the holes in the jaws will show exactly where the pins do bear.

Mr. WHEATON: Defendant's counsel replies to the request of complainant's counsel, and states that the grips referred to are very heavy, weighing two hundred and eighty pounds, and are in a greasy filthy condition, and for that reason counsel for defendant declines to have one brought here for inspection,

but consents that complainant's counsel may go where they are and inspect them; and I will state that the witness, Mr. Bell, promises to bring to San Francisco one of the defendant's grips that has been in use since defendant's road started, and submit it to the inspection of complainant's counsel, and any expert he chooses to bring with him, at the office of the San Francisco Tool Company, which is within two blocks of the counsel's office.

X.-Q. 63. Mr. Bell, in a grip constructed like complainant's grip is there any way in which you could estimate the amount of vertical movement of the pressure-rollers "*f*" in order to open the jaws far enough to receive the cable, and to close them to bind on the cable?

A. Yes, by first knowing the angularity wanted on the incline planes, which could be easily found by laying out a few diagrams.

70 X.-Q. 64. Would you properly term that movement an excessive one?

A. That would depend upon what that movement was. Which movement are you alluding to?

X.-Q. 65. The vertical movement of the rollers in the complainant's grip.

A. Do you mean the model of complainant's grip, or the patent drawings?

X.-Q. 66. In the grip constructed like the complainant's patent calls for?

A. I would not consider it an excessive movement.

X.-Q. 67. Now, from your knowledge of grips, their construction and their operation, would you say that it was essential to the practical operativeness of a grip constructed like the complainant's patent calls for that the rollers "*f*" should turn?

A. I do think so. The proof of that is that the Geary street grips that were made after this patent had the rollers turn.

X.-Q. 68. Do you know the construction of the Geary street grips to which you refer?

A. I do.

X.-Q. 69. Do you know as a matter of fact, Mr. Bell, that if rollers were present on those grips that in the operation of said grips the rollers did actually turn?

A. They did. I would first say that in the practical grips which were made from the Eppelsheimer patents the rollers did not revolve upon the pins, but were one and part of the pins, the pins being turned down to a small diameter on each end of the roller and fitting in a bearing, and that these small pins by their constant use are a source of annoyance, and wear the grip-shanks out.

X.-Q. 70. How much did these rollers in the Geary street road grips turn in operating the grip?

A. I should judge they revolved one-half of their circumference.

X.-Q. 71. Through what length of the jaw face did they move, would you say?

A. About an inch and a half of the face. The inclined planes of the jaws are made with even a lesser angle than were shown in the patent drawings, which gives the grip great power, but more rolling action on the rollers.

X.-Q. 72. How great would be the friction of contact between the rollers and jaws in those Geary street grips than if the rollers did not turn?

A. Well, I wouldn't care to set a figure on that. I don't think anybody could tell without making extensive experiments.

X.-Q. 73. Well, in your opinion, what effect would it have on the grip?

A. It would reduce the power.

X.-Q. 74. Appreciably?

A. Appreciably, I think so, exerted on the rope. If they were not essential they never would be put there, as they often wear out—as the end journals or pins of the rollers often wear out.

X.-Q. 75. Is it not a fact that in the Geary street grips the rollers get so clogged that they do not turn at all in the operation of the grip?

A. I don't think so. If that was the case it would wear flat places on the rollers. And I will state that I had occasion to examine those grips very carefully before building the grips for the road of the Consolidated Piedmont Cable Company, and I found no tendency to wear on the face of the rollers at all.

X.-Q. 76. Now, Mr. Bell, just take the specifications of complainant's patent and point out any places which you find that defines or makes any mention whatever of the angle of the faces of the grip jaws?

A. I have read the patent through before, and I don't remember having seen any mention made of the angle, but still I believe that the angle is one of the essential features of the grip.

X.-Q. 77. You don't found that belief upon anything that is stated in the specification of the patent, do you?

A. I do not.

X.-Q. 78. That is just simply your own opinion?

A. That is my own opinion. I will also state that I back up that opinion from the fact that the Clay Street grip which

preceded this had a wedge in it, and that idea of the wedge was running in the mind of the inventor, in my opinion, when he invented this.

X.-Q. 79. Did you know Mr. Eppelsheimer?

A. I did not.

X.-Q. 80. Well, suppose the angle of the faces of the jaws, as shown in the drawings of complainant's patent, were somewhat greater, would the grip still be operative as a cable railway grip?

A. It would.

X.-Q. 81. If they were less, would it still be operative as a cable railway grip?

A. It would be still better.

X.-Q. 82. Then when you say that the angle which is shown in the Patent Office drawings of the jaws is essential to that grip, you don't mean that if that angle were varied from one side or the other that the grip would be inoperative,
73 do you?

A. No, sir; I do not.

X.-Q. 83. If the angle were less, you say it would be a better grip?

A. I do. Well, I will say that it would be a more powerful grip.

X.-Q. 84. Then will you explain why you have testified that the angle shown in the Patent Office drawings is essential to that grip?

A. Have I testified to that effect?

X.-Q. 85. Just a few answers back I think you so testified. (X.-Q. 76, and the answer thereto read.)

A. In the answer to the previous question I would say that my intention was to convey the idea that Mr. Eppelsheimer considered it an essential feature of the grip.

X.-Q. 86. Do you found your opinion upon what Mr. Eppelsheimer considered essential from anything in the specification of that patent?

A. Not from the specification, but from the patent drawings.

X.-Q. 87. Have you ever made any Patent Office drawings, Mr. Bell?

A. I have not.

X.-Q. 88. Do you happen to know of any of the requirements of the Patent Office for any of the drawings forming part of applications for patents?

A. Not enough to give sworn testimony on.

X.-Q. 89. Now, Mr. Bell, referring to the drawings "Respondent's Exhibit 2," and the sketches "1," "2" and "3"

thereof, and state what opens the jaws of the grip as shown in those sketches?

A. In the sketches there is nothing shown to open the jaws. Those were diagrams made only to show how much the jaws would open with the different positions of the rollers.

74 X.-Q. 90. Could you not add to those three sketches the pin "*e*⁵" of complainant's patent, and which forms the means by which the rollers by coming in contact with it opens the jaws?

A. I do not see that it is necessary. It is shown very plainly in the defendant's model "Exhibit 1."

X.-Q. 91. In "Sketch 5" of defendant's "Exhibit 2," you show the defendant's gripping jaws opened a certain distance. Is that distance sufficient to allow for the discharge of the rope, or the cable?

A. Yes, it is.

X.-Q. 92. And in "Sketch 3" of said exhibit you show the opened position of the jaws of complainant's grip. Is the opening there large enough to permit of the discharge of the cable?

A. It is.

X.-Q. 93. Now, if you had added a sketch of complainant's grip showing the jaws still further opened, then in that sketch the centers of the rollers "*f*" would be above the horizontal plane of the pivotal center of the jaws, would they not?

A. They would.

X.-Q. 94. How old, would you say, Mr. Bell, is a pin connection forming a joint between two parts?

A. I could't tell.

X.-Q. 95. Is it older than 1877?

A. Yes, sir.

(The time within which testimony may be taken herein is extended by agreement of the respective counsel for the parties hereto, to and including the 8th day of May, 1891.)

75

FRIDAY, August 28, 1891.

Present: Mr. Booth of counsel for complainant; Mr. Wheaton, of counsel for respondent.

Re-examination of ARTHUR F. L. BELL, on behalf of respondent.

Mr. BOOTH: During his examination, Mr. Bell stated, as shown on page 50 of the testimony, in response to a request of mine, that he would exhibit to me one of the grips that was used on the defendant's road from the time it commenced running up to that time, and I have to state that Mr. Bell has since that time shown me such a grip, as promised.

By Mr. WHEATON:

Q. 1. Mr. Bell, you have already been sworn in this case, and have testified as a witness?

A. I have.

Q. 2. Please state what this model is which I now show you?

A. This model shows the true principle of the workings of the defendant's grip, and shows particularly what points in the jaws the pins press against while the grip is being opened or closed. It particularly shows that there is no wedging action when the grip is closing on the rope.

(The model above referred to is introduced in evidence by respondent, and marked "Respondent's Exhibit 3.")

Q. 3. In this model "Exhibit 3," what does the handle represent; is it the stationary or sliding part of the grip?

76 A. It represents the sliding plate which is in the grip.

Q. 4. Then as the grip works would the center pin of "Exhibit 3" be stationary, or would it move up and down?

A. It would always be stationary, being held by the end crotches of the grip.

Q. 5. Do the pins which pass through each end of the handle correctly show how those pins bear against the sides of the different holes through which they pass in the actual grip?

A. They do, exactly.

(Testimony closed.)

77

Certificate to Depositions.

I certify that the foregoing depositions were taken at the place stated in the caption to said depositions, at the several times set forth in said depositions, in my presence, and in the presence of counsel for the respective parties to the cause in said caption entitled; that, previous to giving his testimony, each of the witnesses in said depositions named was by me duly sworn to tell the truth, the whole truth and nothing but the truth, in said cause; that said depositions were taken down in shorthand writing and transcribed by A. L. Coombs, pursuant to agreement of counsel; that said depositions, after being so transcribed, were read by, or by me to, the said witnesses, and signed by them, respectively, except in those cases where such reading and signing were, by agreement of said counsel, waived, as in said depositions set forth; and that I have retained said depositions for the purpose of delivering the same with my own hand to the Court for which they were taken.

Accompanying said depositions, and forming part thereof, are the several exhibits introduced in connection therewith, and referred to and specified therein.

I further certify that I am not attorney nor of counsel for any of the parties to said cause, nor in any way interested in the event thereof.

In witness whereof, I have hereunto set my hand, this second day of September, A. D., 1891.

S. C. HOUGHTON,
Examiner in Chancery, U. S. Circuit Court, Northern Dist. of Cal.

(Endorsed:) Filed Sept. 3, 1891. L. S. B. Sawyer, Clerk.

78 U. S. Circuit Court, N. Dist. of Cal.

PACIFIC CABLE RY. Co.,	}	No. 10986.
vs.		
CONS. PIEDMONT CABLE Co.		

Complainant's Exhibit A.

(Patent Sued On.)

S. C. H., *Examiner.*

UNITED STATES PATENT OFFICE.

William Eppelsheimer, of San Francisco, California.

Improvement in Clamps for Endless-rope Railways.

Specification forming part of Letters Patent No. 189,204, dated April 3, 1877. Application filed February 3, 1877.

To all whom it may concern:

Be it known that I, William Eppelsheimer, of the City and County of San Francisco, in the State of California, have invented an Improved Clamp Apparatus for Tramways or Street Railways, in which an endless cable is used as the motive power, of which the following is a full, clear and exact description, reference being had to the accompanying drawings, forming part of this specification.

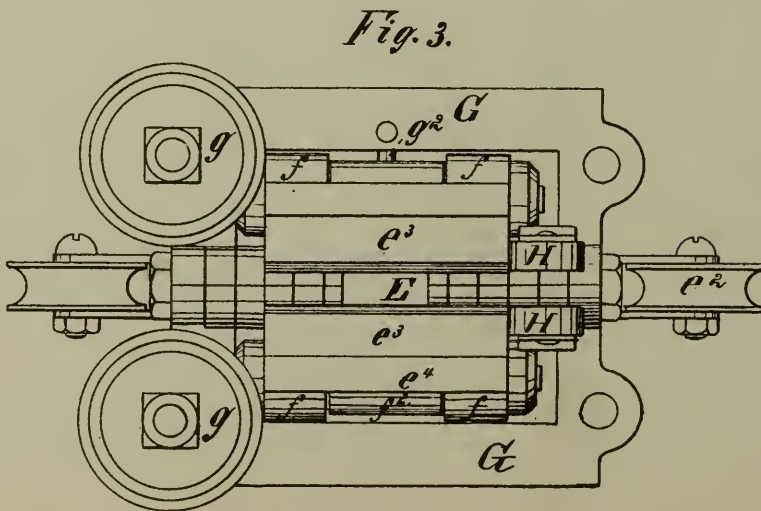
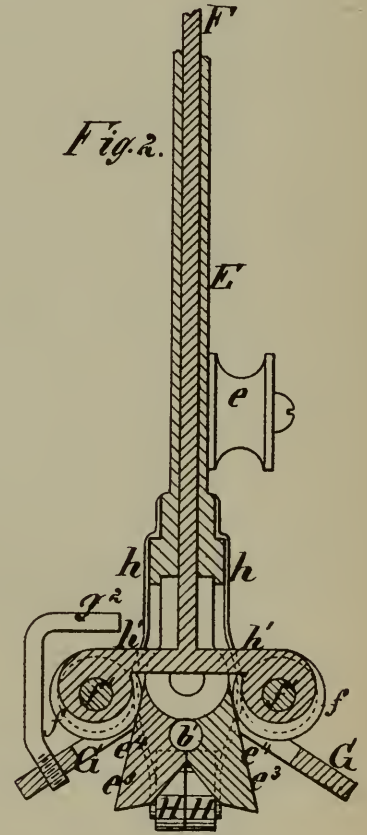
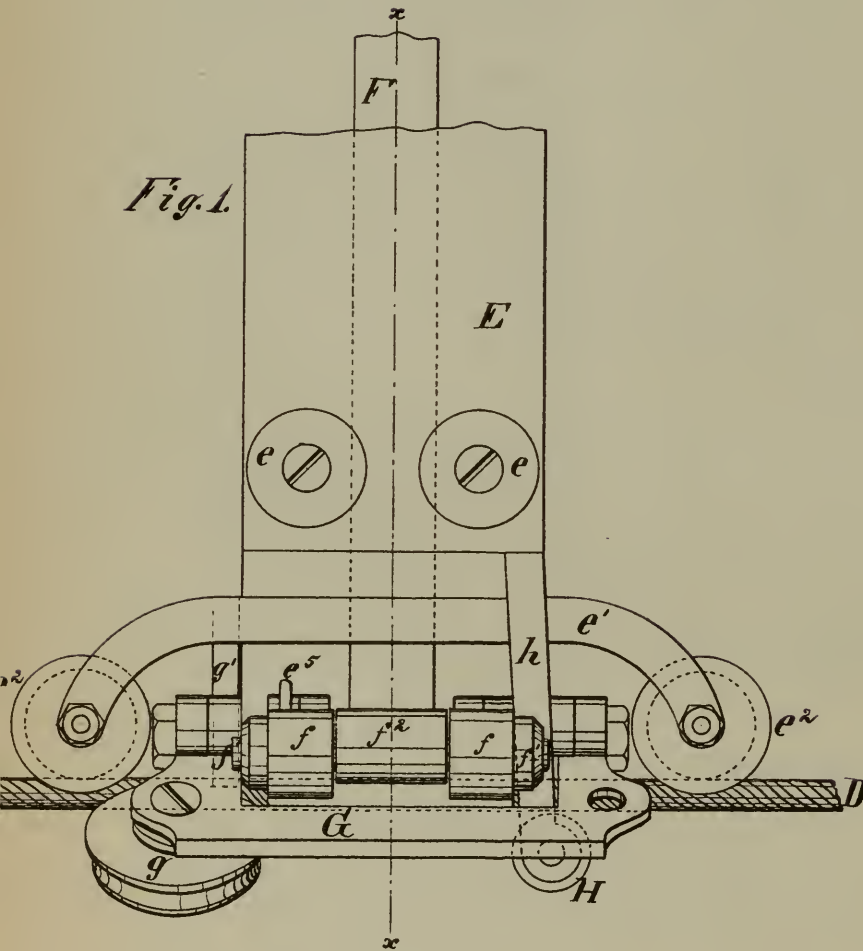
My invention relates to the device employed to gripe and hold the rope, band, or other cable used in tramways or street-railways as the motive power for propelling the cars, said cable being placed in a tunnel or tube beneath the level of the road-bed; and where pulleys in the roof of said tube are necessarily employed, as in roads built over an uneven or undulating surface, to maintain the said cable in a proper position in the said tube, whereby I am enabled to arrange the rope or cable in the tunnel to one side of, and not directly beneath, or in line vertically with, the slot or opening in the roof of the tunnel through which the shank of the griping device enters the tunnel, thus protecting the cable from immediate contact with, and injury by, the dirt

W. EPPELSHEIMER.

CLAMP FOR ENDLESS ROPE RAILWAYS.

No. 189,204.

Patented April 3, 1877.



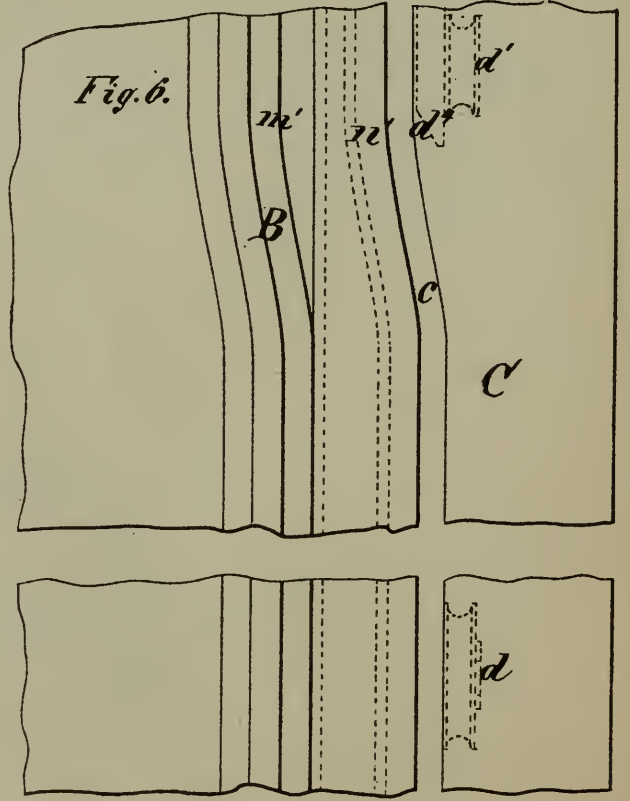
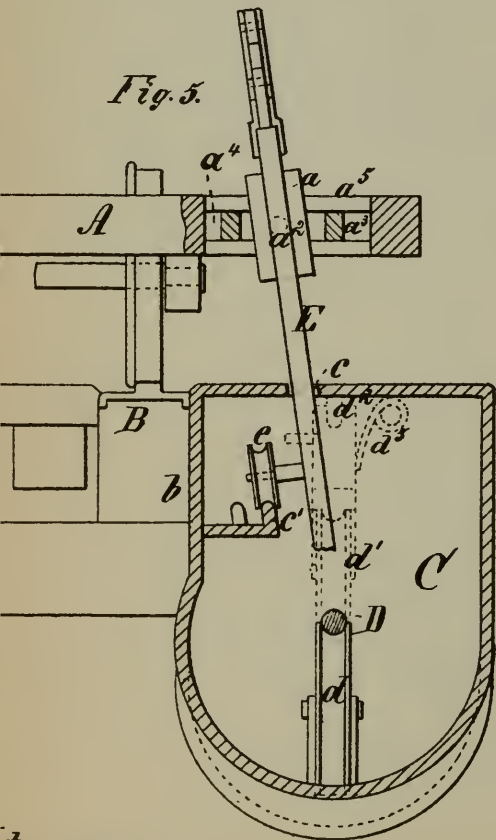
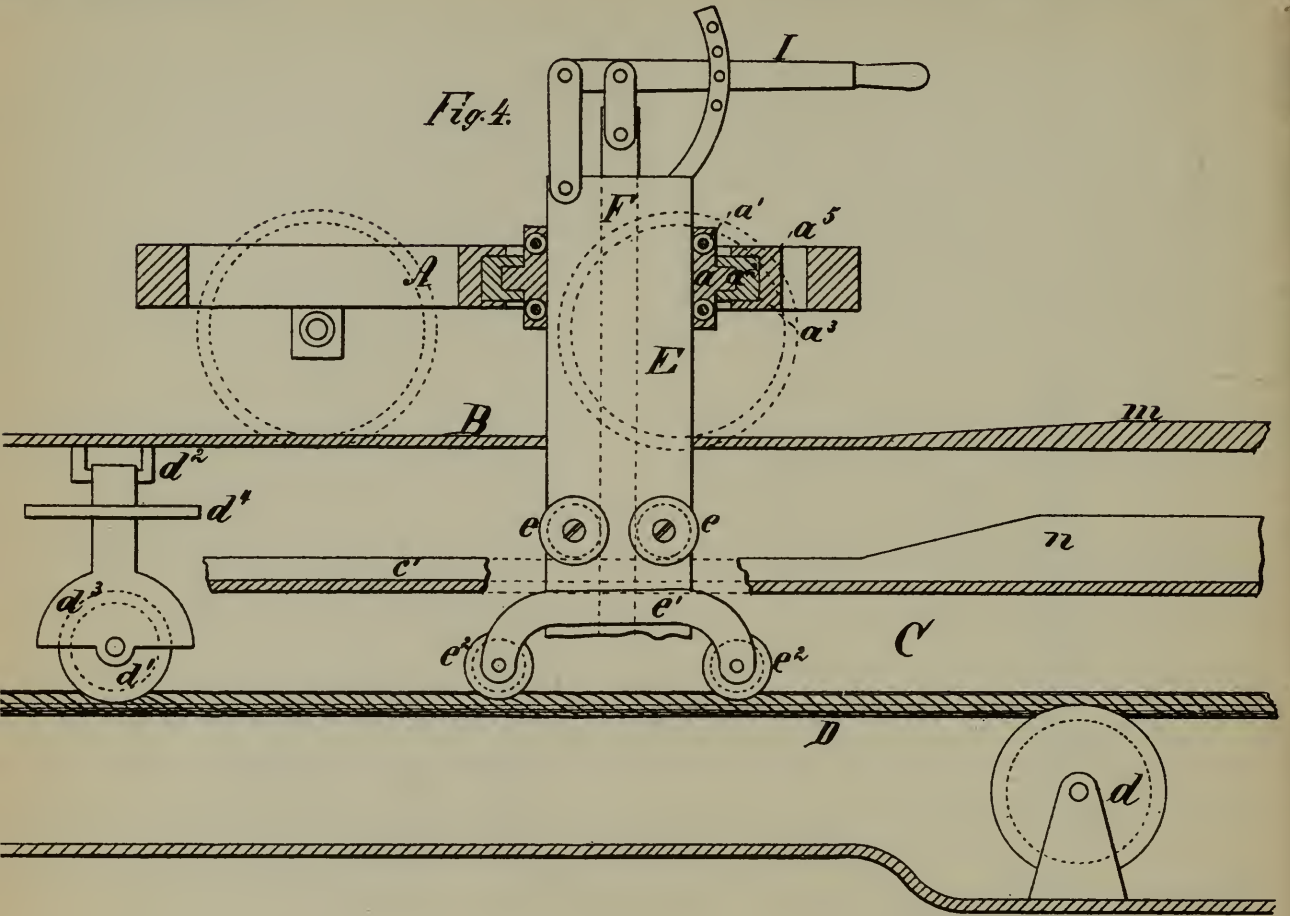
Witnesses:

Inventor:

CLAMP FOR ENDLESS ROPE RAILWAYS.

No. 189,204.

Patented April 3, 1877.



Witnesses.

Inventor:

or water which may be admitted through said slot, while at the same time I do away with the employment of the heavy and expensive L-shaped gripping device now in use in connection with the above-recited arrangement of parts; and my invention consists in the devices and combinations hereinafter described and claimed, whereby the advantages set forth are secured.

Figure 1 is a side elevation of my improved rope-gripping device. Fig. 2 is a longitudinal central sectional view of the same on the line xx , Fig. 1. Fig. 3 is a lower end view of the same. Fig. 4 is a longitudinal sectional side view of a tunnel and road-bed, showing truck with my gripping device attached, and its position on the cable in the tunnel. Fig. 5 is a vertical cross-section of the parts shown in Fig. 4. Fig. 6 is a plan view of the road-bed, showing the arrangement of the longitudinal slot in the roof of the tunnel.

A is the car or truck; B, the rails, and C the tunnel, in which is the endless cable D. This tunnel C, I show at one side of the track, and this arrangement is preferable in adapting the system herein described to an ordinary tramway, as the tunnel may be laid without disturbing the rails or ties, while the string-piece b of one of the rails may be made to form part of the wall of the tunnel. In the floor or bottom of the tunnel are placed at suitable distances the cable supporting pulleys d , over which the cable runs, while in the roof of the tunnel is formed the continuous opening or slot c , through which the gripping device is entered, and at one side of this slot, over the line of the pulleys d , are fixed in the roof, and depending therefrom, the cable-pulleys d' , under which the cable passes, being guided thereby. The cable is thus maintained at one side of the line of the slot c —that is, away from the vertical line of its opening. The upper pulleys d' are hung in hangers, which are hinged at d^2 to the roof, and are protected by a hood, d^3 , while a bar, d^4 , the ends of which are curved or rounded off, is fixed on the sides of the hangers, adjacent to the slot c , and projecting at right angles from that side. The hangers are held in position by the spring d^5 . On the interior of the wall of the tunnel, adjacent to the road-bed, is arranged a projecting-rail, c' , Figs. 4, 5, and 6. This rail may be continuous throughout the tunnel, or may be fixed to the tunnel wall at the places where the pulleys d and d' occur in the tunnel, extending for a suitable distance beyond the places of the pulleys in both directions. This track is curved or carried away from the upper pulleys d , wherever they occur, and is raised or curved upward at the places of the lower pulleys d' .

The cable-gripping device, which is only partly shown on Sheet 2 of the drawings, but which is plainly shown on Sheet 1, has a shank, E, which passes through the slot c of the tun-

nel, and extends upward to the truck, where it is arranged to slide up and down in a box, a , the said box having friction-rollers a' to facilitate this movement. The box a is pivoted at its ends at a^2 in a frame, a^3 , which slides in ways a^4 formed in a main frame, a^5 , the said main frame a^5 being formed as part of the truck-frame resting on the axles, and extending to one side of the truck over the line of the tunnel C. When the tunnel is arranged in the middle of the road-bed this frame a^5 may be dispensed with, and the shank-piece may be mounted, as described, in the frame of the truck. Upon the side of the shank E within the tunnel are mounted the wheels or rollers e , which run on the track or rail e' , while upon the lower end of the shank, mounted in a cross-frame, e' , are the guide-pulleys or rollers e^2 —one at each side, front and rear, resting on the cable D.

The cable-gripping device is constructed as follows: In an aperture extending longitudinally through the shank E is arranged the slide bar or rod F. Upon the lower end of the shank E are hinged the jaws e^3 , between which, in suitable semicircular recesses or channels b' on their inner faces, the cable is grasped. The outer faces of these jaws are inclined outwardly from the hinge-joint to their lower edges, as shown at e^1 , Fig. 3, and upon these faces are arranged to bear-friction-rollers f , which are mounted on axles f' arranged above the jaws, and fixed in, and carried by, a cross-piece f^2 , which is fixed on the lower end of the slide F. e^5 is a pin set in one of the eye-pieces of the hinge-joint of the jaws, and projecting above one of the said friction-rollers f .

G G are frames hinged to the lower end of the shank E, and carrying upon one or both ends the guide-rollers g , each pair being arranged to engage between them the cable D, and to support it and guide it to the jaws e^3 . These frames are pressed downward, and their rollers thus held upon the cable by a spring, g' , while an angle arm or stud, g^2 , fixed in one of them, as seen in Fig. 2, and extending up and over the cross-piece f^2 on the slide f , operates to swing the frame, and, consequently, to part the rollers g when the slide is raised and it is desired to disengage the gripping device from the cable. Two half-rollers, H, (carried by spring-arms h , which extend downward from the shank E and pass under the friction-rollers f carried by the slide F, and which said rollers are brought side by side to form one roller to support and guide the cable to the jaws e^3 by the downward movement of the slide, the rollers f pressing upon the curves h' in the arms h), may be employed instead of the rollers g , or they may be employed at one end of the jaws in connection with a single pair of the rollers g in frames G, at the other end of the jaws, as shown in the drawings, Sheet 1.

The rollers H are operated to release the cable when the gripping device is disengaged therefrom by the raising of the slide F, when, the spring-arms *h* being relieved from pressure by the rollers *f*, the two half-rollers will separate from each other, and the cable may pass between them. The slide and its shank-piece E may be conveniently raised or lowered by means of a lever, as shown at I, Figs. 4 and 5.

The operation of my invention is as follows: The shank E and the gripping device carried by it being hung in its seat in the box *a* in the car-frame, as described, and being passed into the tunnel C, the shank extending through the slot *c* in the roof of said tunnel, as seen in Figs. 4 and 5, the shank may be tilted at an angle in its frame, so that the gripping device may be brought over the line of the cable, as seen in Fig. 5. The shank is lowered until the rollers or pulleys *e*² rest upon the cable, and the rollers or wheels *e* rest on the track or rail *c*'. The slide F is now forced downward in the shank E, and, by means of the pressure of the rollers *f* on the outer faces of the jaws *e*³, the jaws are closed upon the cable and gripe it tightly, while the rollers *g* or H support and guide the cable to the jaws. The truck or car is thus set in motion, and, as the gripping device moves along with the cable, it encounters in its progress the lower pulleys *d* and the upper pulleys *d*'. Opposite to the lower pulleys *d* the rail *c*' is elevated or curved upward for a short distance, then returning to its former level, as shown at *n*, Fig. 4.

The rollers or wheels *e*, traveling on this rail, mount this curve or elevation, and carry the shank E upward in its seat in box *a*, thus lifting the jaws and other portions of the gripping device away from and over the pulley *d*, the cable again dropping into its place on said pulley, when the rollers descend from the elevation, and the shank again passes downward in the slot *c*. To prevent a too violent raising of the shank in going over the elevation *n*, the rail of the track B may be also elevated or curved upward, as seen at *m*, Fig. 4, so that as the shank is raised in the box *a*, the car or truck itself will also rise on the road-bed. This I do not, however, deem essentially necessary to the successful working of the invention. When the shank encounters the upper pulleys *d*' it strikes the bar *d*⁴, and, by its contact therewith, swings the pulley away from the shank and gripping device, while the rail *c*', being curved away from the said pulley opposite thereto at *n*', the shank is, by its rollers *e*, carried away from the pulley and the gripping device and the pulley thus escape each other. To obviate too violent an oscillation of the shank in its seat in the car-frame, by its being swung away by the engagement of the rollers *e* with the curve *n*' of the rail *c*', the rails B of the road-bed may

be curved away from or around the point where the pulley d' is situated in the tunnel, as at m' , thus carrying the truck or car away from the said pulley, and to that extent bringing the shank and griping device away from the said pulley, without said shank being so greatly swung or oscillated in its seat in its box a in the truck-frame. I do not, however, consider the curve m' in the rails B essential to the working of my invention, the interior rail c' and the bar d^4 being sufficient to accomplish the passage of the shank and griping device across the upper pulleys without contact between them. When it is desired to stop the car, the slide F is raised in the shank, when the jaws are released by the rollers f , and the pin e^5 being struck by the upper face of one of said rollers, the jaws are parted, and the cable released. The cable now plays along between the rollers g and over the rollers H, while the car may be brought to a standstill. The slide being still further raised, the pulleys g are disengaged from the cable, and the rollers H separated, so that the cable may drop between them, when the shank may be raised, and the entire griping device brought above, and wholly disconnected from the cable.

What I claim as my invention, and desire to secure by letters patent, is:

1. In a device for clamping a car to an endless traveling cable, the combination, with the shank E, carrying the clamping device, and having vertical movement and lateral oscillation in its seat or bearings in the car truck, and provided with the wheels or pulleys e , of the rail c' , having curves n' and elevations n , as and for the purpose described.

2. The combination of the shank E, carrying the clamping device, and in which works the operating slide F, with the box a , pivoted at a^2 in frame a^3 , which slides in ways a^4 in truck-frame a^5 , as described.

3. The combination, with the shank E, as described, of the hinged clamping-jaws e^3 , together with the operating slide F, its cross-bar f^2 , and bearing rollers f , as and for the purpose specified.

4. The combination, with the shank E, its hinged jaws e^3 , and the operating slide F, carrying rollers f , of the hinged frames G, carrying guide-pulleys g , as and for the purpose specified.

5. The combination, with the shank E, jaws e^3 , and slide F, with rollers f , of the spring-arms h , carrying the half pulleys H, as described, and for the purpose specified.

6. The combination, with the shank E, carrying the cable-griping devices, of the cross-piece e' , carrying the front and rear upper guide-pulleys e^2 , as described, and for the purpose specified.

7. The combination, with the hinged upper cable guide-pulley d' , having hood d^2 and spring d^5 , of the curved bar or plate d^4 , arranged to operate as and for the purpose specified.

WILLIAM EPELSHEIMER.

Witnesses:

J. C. CEBRIAN,
E. J. MOLERA.

(Endorsed:) Filed Sept. 3, 1891. L. S. B. Sawyer, Clerk.

79 *Petition for an Order Allowing an Appeal.*

In the United States Circuit Court, Northern District of California.

PACIFIC RAILWAY COMPANY, Complainant,

vs.

CONSOLIDATED PIEDMONT CABLE COMPANY,

Respondent.

} In Equity.

} No. 10986.

The Consolidated Piedmont Cable Company, respondent in the above entitled cause, feeling itself aggrieved by the decretal order made by said Court on the 29th day of February, 1892, and the interlocutory decree made and entered on the 3rd day of March, 1892, in pursuance of said order, whereby it was ordered, adjudged and decreed that the third claim of complainant's patent sued upon in said cause, was good and valid in law, and that complainant was entitled to an injunction, and whereby the complainant was awarded an injunction and a reference to the Master in Chancery of said Court, for an accounting with costs, comes now by Wheaton, Kalloch & Kierce its solicitors, and petitions said Court for an order allowing said respondent to prosecute an appeal from said interlocutory to decree to the Honorable the United States Circuit Court of Appeals for the Ninth Circuit, under and according to the laws of the United States in that behalf made and provided, and also that an order be made fixing the amount of security which respondent shall give and furnish upon such appeal, and that upon the giving of such security all further proceedings in this Court be suspended and stayed until

80 the determination of said appeal by said United States Circuit Court of Appeals for the Ninth Circuit.

And your petitioner will ever pray.

WHEATON, KALLOCH & KIERCE,
Solicitors for Respondent.

(Endorsed:) Filed March 9, 1892. L. S. B. Sawyer, Clerk.

81

Assignment of Errors.

In the United States Circuit Court of Appeals, for the Ninth
Judicial Circuit.

CONSOLIDATED PIEDMONT CABLE COMPANY, Appellant, }
vs. }
PACIFIC CABLE RAILWAY COMPANY, Appellee. }

Now comes the Consolidated Piedmont Cable Company, appellant herein, by Wheaton, Kalloch & Kierce, its solicitors and counsel, and particularly specifies the following as the errors upon which it will rely, and which it will urge upon its appeal in the above entitled cause:—

1.

That the Circuit Court of the United States for the Northern District of California erred in holding that the appellant herein infringed upon the third claim of the letters patent sued upon.

2.

That the said Court erred in holding that the alleged infringing grips contained the combination called for in the third claim of the appellee's patent, inasmuch as the evidence showed that there were no bearing rollers in the alleged infringing grips as called for by said claim and no equivalent therefor.

3.

82 That the said Court erred in holding that the loose pins fitted in the outer portion of the jaws of the appellant's grips are the equivalents of the friction or bearing rollers of the combination covered by the third claim of the appellee's patent.

4.

That the said Court erred in holding that the appellant's grip effects substantially the same result in substantially the same way as the appellee's grip.

5.

That the said Court erred in ordering an interlocutory decree against the appellant, ordering adjudging and decreeing that the appellee is entitled to an injunction, and decreeing a reference to the Master in Chancery of said Court for an accounting.

In order that the foregoing assignment of errors may be and appear of record, the appellant presents the same to the Court and prays that such disposition be made thereof as in accord-

ance with law and the statutes of the United States in such cases made and provided.

All of which is respectfully submitted.

WHEATON, KALLOCH & KIERCE,
Solicitors for Appellant and Respondent.

(Endorsed:) Filed March 9, 1892. L. S. B. Sawyer, Clerk.

83 *Order Allowing Appeal and Fixing Bond.*

At a stated term, to wit, the February term, A. D. 1892, of the Circuit Court of the United States of America, of the Ninth Judicial Circuit, in and for the Northern District of California, held at the court room in the City and County of San Francisco, on Wednesday, the 9th day of March, in the year of our Lord one thousand eight hundred and ninety-two.

Present: The Honorable William W. Morrow, United States District Judge.

PACIFIC CABLE RAILWAY COMPANY,	} No. 10,986.
<i>vs.</i>	
CONSOLIDATED PIEDMONT CABLE COMPANY.	

On motion of F. J. Kierce, Esq., of counsel for respondent, W. F. Booth, Esq., solicitor for complainant being present and not opposing said motion, it is ordered that an appeal to the United States Circuit Court of Appeals for the Ninth Circuit, from the Interlocutory Decree heretofore filed and entered herein, be and the same hereby is allowed, and that a certified transcript of the testimony, exhibits, record and all proceedings herein, be forthwith transmitted to said United States Circuit Court of Appeals on giving bond on appeal for five hundred dollars.

On like motion, it is ordered that the injunction ordered in said Interlocutory Decree be and the same hereby is suspended pending said appeal, upon respondent giving a bond in the sum of two thousand five hundred dollars.

84 *Bond on Appeal.*

In the United States Circuit Court of Appeals, Ninth Circuit.

CONSOLIDATED PIEDMONT CABLE COMPANY, Appellant,	})
<i>vs.</i>	
PACIFIC CABLE RAILWAY COMPANY, Appellee.	

Know all men by these presents, that we, Montgomery Howe and Mrs. Phebe A. Blair, are held and firmly bound unto the above named appellee, the Pacific Cable Railway Company, in the sum of five hundred dollars, lawful money of the United

States of America, to be paid to the said appellee, its successors and legal representatives, to which payment, well and truly to be made, we bind ourselves and each of us jointly and severally, and our and each of our heirs, executors and administrators firmly by these presents.

Dated this 11th day of March, 1892.

The condition of the above obligation is such, that whereas said appellant has taken an appeal to the United States Circuit Court of Appeals, for the Ninth Circuit, to reverse the Interlocutory Decree rendered and entered by the Circuit Court of the United States, Ninth Judicial Circuit, in and for the Northern District of California, in the case entitled Pacific Cable Railway Company vs. Consolidated Piedmont Cable Company, No. 10,986, which said Interlocutory Decree was rendered in said Circuit Court on the 29th day of February, 1892, and entered in said

85 Court on the 3rd day of March, 1892, being a day in the February term, 1892, of said Circuit Court.

Now therefore, if the above named appellant shall prosecute its said appeal to effect and answer all damages and costs if it shall fail to make good its plea, then this obligation shall be void, otherwise to remain in full force and effect.

MONTGOMERY HOWE.

MRS. PHEBE A. BLAIR.

Signed, sealed and delivered in presence of

UNITED STATES OF AMERICA,
Northern District of California, } ss.
City and County of San Francisco. }

Montgomery Howe, being duly sworn, deposes and says that he is a resident and freeholder in said district, and is worth the sum of five hundred dollars, exclusive of property exempt from execution, and over and above all debts and liabilities.

MONTGOMERY HOWE.

Subscribed and sworn before me, this 11th day of March, A. D. 1892.

[SEAL.]

EUGENE W. LEVY,
Notary Public.

UNITED STATES OF AMERICA,
Northern District of California, } ss.
County of Alameda. }

Mrs. Phebe A. Blair, being duly sworn, deposes and says that she is a resident and freeholder in said district, and is worth the sum of five hundred dollars, exclusive of property ex-

empt from execution, and over and above all debts and liabilities.

MRS. PHEBE A. BLAIR.

86 Subscribed and sworn to before me this 11th day of March, 1892.

[SEAL.] WILL. H. BURRALL,
Notary Public, in and for Alameda County, State of California.

(Endorsed:) Form of bond and sufficiency of sureties approved. (Signed) Hawley, Judge. Filed March 12, 1892. L. S. B. Sawyer, Clerk.

87 *Bond on Suspension of Injunction.*

In the United States Circuit Court in and for the Northern District of California.

PACIFIC CABLE RAILWAY COMPANY, Complainant,	} No. 10,986.
<i>vs.</i>	
CONSOLIDATED PIEDMONT CABLE COMPANY, Respondent.	

Know all men by these presents, that we, the undersigned, are jointly and severally held and firmly bound unto the Pacific Cable Railway Company, the complainant above named, in the sum of two thousand and five hundred dollars (\$2,500.00), lawful money of the United States, for the payment of which well and truly to be made, we bind ourselves, our heirs and assigns, jointly and severally, firmly by these presents.

The condition of the above obligation is such that

Whereas, in the above entitled suit an interlocutory decree has been made and entered in favor of the complainant, containing an injunctive order restraining the respondent from the further use of the grips now in use upon its railway in the City of Oakland and its suburbs, in the county of Alameda, and

Whereas, the said Court has ordered that the said injunction be suspended until the determination of the appeal taken from said interlocutory decree, in the United States Circuit Court of Appeals for the Ninth Circuit, upon the respondent's giving to said complainant a bond securing to the complainant the
88 payment by respondent of any judgment that may finally be obtained against the respondent in said suit: now

Therefore, if the said respondent, the Consolidated Piedmont Cable Company, shall pay or cause to be paid to said complainant any judgment that may in said suit be finally obtained against the said respondent, then this obligation shall be void, otherwise of full force and effect.

Witness our hands and seals this 11th day of March, 1892.

MONTGOMERY HOWE, [SEAL.]
MRS. PHEBE A. BLAIR, [SEAL.]

STATE OF CALIFORNIA, }
City and County of San Francisco, } ss.

Montgomery Howe, being duly sworn, says that he is a resident and freeholder within the Northern District of the State of California, and is worth the amount specified in the foregoing obligation and for which he becomes surety therein, over and above all his just debts and liabilities, and exclusive of property exempt from execution.

MONTGOMERY HOWE.

Subscribed and sworn to before me this 11th day of March, 1892.

[SEAL.]

EUGENE W. LEVY,
Notary Public.

89 STATE OF CALIFORNIA, }
County of Alameda, } ss.

Mrs. Phebe A. Blair, being duly sworn, says that she is a resident and freeholder within the Northern District of the State of California, and is worth the amount specified in the foregoing obligation and for which she becomes surety therein, over and above all her just liabilities, and exclusive of property exempt from execution.

MRS. PHEBE A. BLAIR.

Subscribed and sworn to before me this 11th day of March, 1892.

(SEAL.)

WILL H. BURRALL,
*Notary Public in and for said Alameda County,
State of California.*

(Endorsed:) Form of bond and sufficiency of sureties approved, (signed) Hawley, Judge. Filed March 12, 1892. L. S. B. Sawyer, Clerk.

90 *Order Allowing Withdrawal of Original Exhibits.*

At a stated term, to wit: the February term, A. D 1892, of the Circuit Court of the United States of America, of the Ninth Judicial Circuit, in and for the Northern District of California, held at the court room in the City and County of San Francisco, on Friday the 8th day of April, in the year of our Lord one thousand eight hundred and ninety-two.

Present: The Honorable William W. Morrow, United States District Judge.

PACIFIC CABLE RAILWAY COMPANY,
vs.
 CONSOLIDATED PIEDMONT CABLE COMPANY. } No. 10,986.

Upon motion of F. J. Kierce, Esq., counsel for the respondent, it is ordered that the following original exhibits, viz: Complainant's Exhibits B, C, D, and E; respondent's Exhibits 1 and 3 (being models), and respondent's Exhibit 2 (being a drawing), be allowed to be withdrawn from the files of this cause for the purpose of being transmitted to the United States Circuit Court of Appeals for the Ninth Circuit, as a part of the record on appeal to said United States Circuit Court of Appeals in this cause. The said original exhibits to be delivered to the solicitors for the respondent herein, and to be returned to the files of this cause in this Court upon the final determination of the appeal herein by said United States Circuit Court of Appeals.

Certificate to Transcript.

In the Circuit Court of the United States, of the Ninth Judicial Circuit, Northern District of California.

PACIFIC CABLE RAILWAY COMPANY,
vs.
 CONSOLIDATED PIEDMONT CABLE COMPANY. } No. 10,986.

I, L. S. B. Sawyer, Clerk of the Circuit Court of the United States of America, of the Ninth Judicial Circuit, in and for the Northern District of California, do hereby certify that the foregoing ninety (90) written and printed pages, numbered from 1 to 90 inclusive, to be a full, true and correct copy of the record and proceedings in the above and therein entitled suit (excepting therefrom the complainant's original Exhibits B, C, D, and E, and respondent's Exhibits 1 and 3 (models), and respondent's Exhibit 2 (drawing), which said original exhibits, by order of Court, accompany and form a part of this record), and that the same together constitute the transcript of the record herein, upon appeal to the United States Circuit Court of Appeals for the Ninth Circuit.

In testimony whereof, I have hereunto set my hand, and affixed the seal of said Circuit Court, this 18th day of April, A. D. 1892.

[SEAL.]

L. S. B. SAWYER,
 Clerk U. S. Circuit Court, Northern District of California.

Citation.

UNITED STATES OF AMERICA, ss:

The President of the United States to Pacific Cable Railway Company, a corporation organized and existing under and by virtue of the laws of the State of California, greeting:

You are hereby cited and admonished to be and appear at a United States Circuit Court of Appeals, for the Ninth Circuit, to be holden at the City of San Francisco, in the State of California, on the 28th day of April next, pursuant to an order allowing appeal entered in the Clerk's office of the Circuit Court of the United States, for the Northern District of California, from an interlocutory decree, signed, filed and entered on the 3rd day of March, 1892, in that certain suit No. 10986, wherein Consolidated Piedmont Cable Company, a corporation organized and existing under and by virtue of the laws of the State of California, is respondent and appellant, and you are complainant and appellee, to show cause, if any there be, why the interlocutory decree rendered against the said appellant as in the said order allowing appeal mentioned, should not be corrected, and why speedy justice should not be done to the parties in that behalf.

Witness, the Honorable Wm. W. Morrow, United States District Judge for the Northern District of California, this 29th day of March, A. D. 1892.

WM. W. MORROW,
U. S. District Judge, Northern District of California.

(Endorsed:) Service of the within citation and receipt of a copy thereof admitted this 30th day of March, 1892. Wm. F. Booth, Solicitor for Complainant and Appellee. Filed March 30, 1892. L. S. B. Sawyer, Clerk U. S. Circuit Court, Northern District of California.